INDUSTRIAL MEDICINE AND SURGERY

Volume 25 MARCH 1956 Number 3

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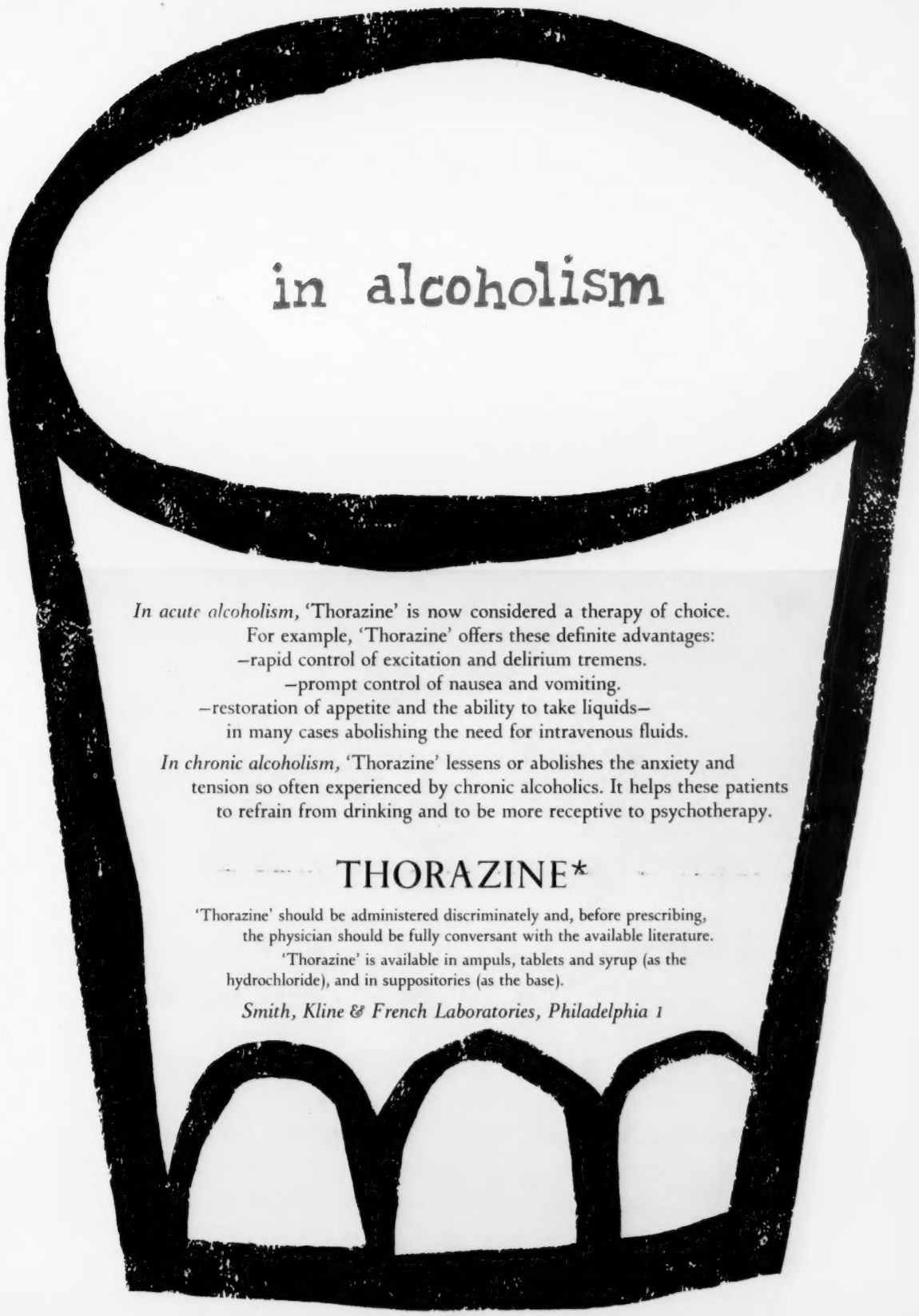
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This Journal is dedicated to the advancement of sound industrial medicine, including the surgery of industrial trauma. To that end its varying contents will embrace scientific papers, reports, digests, news items and official statements, together with editorial comment. The editorial policy is to avoid undue censorship. Some contributions ably prepared will be published although contravening the personal opinions of the editors. Care will be exercised in checking the accuracy of known facts, as printed, but in all other respects statements and opinions are those of the author and may not be shared by the editors. On any article, the editors reserve the right to comment favorably or otherwise, in the current or any subsequent issue. On this basis, contributions are invited. The opinions expressed in any contributions, including the editorials of this Journal, do not necessarily reflect the attitude or opinions of any associated organization.

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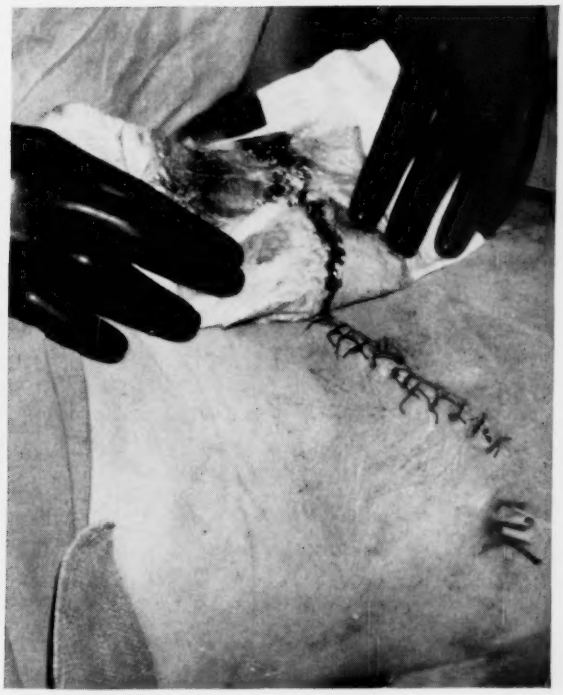

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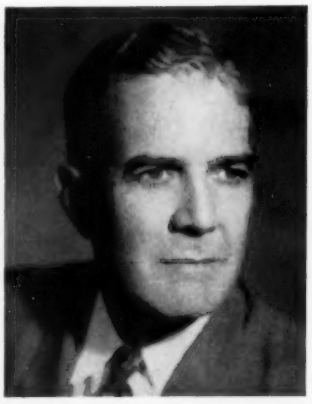

RONALD HELPS has been named Executive Director of the Occupational Health Institute. MR. HELPS will be responsible for supervision of the administrative and effective functioning of the activities of OHI. In the words of DR. FRANK CALDERONE, OHI President, "He will assist the Officers and Directors of the Institute in planning an integrated program for the years ahead to win greater understanding, appreciation, and support from industry." MR. HELPS received the Degree of Bachelor of Chemistry from Cornell University. He served as Vice-President in charge of Laboratory Sales, and later was a Director and Secretary in charge of Public Relations for Schieffelin & Company, New York. He was subsequently Vice-President in charge of Sales for Chemical Specialties Company, New York; and later was Executive Assistant to the General Manager of Pfizer Laboratories Division, Chas. Pfizer & Company, Inc., Brooklyn, immediately before assuming his new duties. He is a former Director and Eastern Vice-President of the American Pharmaceutical Manufacturers Association, a member of the American Pharmaceutical Association, and a member of the Chemists' Club of New York. He resides in Ridgewood, New Jersey, where he is on the Board of Governors of Valley Hospital.

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ber 25, 1955. Quoting PAUL H. RHAME, New Departure's General Manager, the article says: "To have the sincere interest of the employee at heart is the secret of good industrial relations. And no better example exists of the 'sincere interest' which progressive management has in its employees than the modern industrial Medical Department."

JOHN J. BRANDABUR, M.D., of Huntington, West Virginia, has been named Chief Medical Examiner for the Chesapeake & Ohio Railway. He has served as Chief Medical Examiner at Huntington since 1944. In addition to his duties with the main line of the C. & O., he will also head the Medical Department of the northern division, which includes the Pere Marquette.

UNITED Air Lines (G. J. KIDERA, M.D., Medical Director) has Medical Departments at Chicago, where C. E. MURPHY, M.D., has been District Medical Director since July 1, 1951, and J. N. WAGGONER, M.D., has been Medical Examiner since November 14, 1952; at Denver, where L. C. BENESH, M.D., has been District Medical Director since January 1, 1946; at San Francisco, where A. C. LADD, M.D., has been District Medical Director since January 1, 1946; F. R. SCHWARTZ, M.D., has been Medical Examiner since July 1, 1954, and W. H. WILKINSON, M.D., has been Medical Examiner since November 16, 1955; and at Idlewild, (New York International Airport) where G. F. CATLETT, M.D., is District Medical Director, appointed September 6, 1955.

J. HUBER WAGNER, M.D., Pittsburgh, who retired as Medical Director of United States Steel Corporation after 35 years of service—being succeeded by ROBERT B. O'CONNOR, M.D.—will serve as Chairman of a United States Steel Medical Advisory Committee.

WILLARD V. MERRIHUE, New York City, Chairman, Management Advisory Council, American Association of Industrial Nurses, in *Business Week*, November 12, 1955, answers an unsigned letter in the same magazine, September 17, "blaming the shortage of registered nurses in hospitals on the use of industrial nurses in factories." He disposes of that never-true contention—

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These Figures Tell the Story

NUTRIENTS and CALORIES	N.R.C. ALLOWANCES* Physically Active Male	CEREAL SERVING CONTRIBUTION**	PER CENT OF DAILY ALLOWANCES
PROTEIN	65 Gm.	7.85 Gm.	12
CALCIUM	0.8 Gm.	0.17 Gm.	21
IRON	12 mg.	1.44 mg.	12
PHOSPHORUS	1.2 Gm.	0.215 Gm.	18
VITAMIN A	5000 I.U.	187.5 I.U.	4
THIAMINE	1.6 mg.	0.16 mg.	10
RIBOFLAVIN	1.6 mg.	0.24 mg.	15
NIACIN	16 mg.	1.4 mg.	9
CALORIES	3200	208	6.5

OF THE NUTRIENT CONTRIBUTION OF THE CEREAL AND MILK SERVING . . .

As the table above vividly shows, the nutrient contribution of the cereal and milk serving** is unusually generous, not only as to the number of nutrients, but also as to the amount of each nutrient supplied. In the case of most nutrients, 10 per cent or more of the National Research Council's Recommended Daily Dietary Allowances for a physically active male is supplied by this serving. Any food which contributes 10 per cent of the daily requirement of a given nutrient in each 200 calories of that food, is considered a good source of that nutrient. A glance at the chart above shows that the cereal and milk serving comes close to making this ideal contribution. Of added nutritional significance is its generous contribution of B complex vitamins and iron and the high calcium content.

Early in April each year the American Dairy Association and the Cereal Institute and its members join together for the Spring Cereal and Milk Festival to promote this economical and convenient food team with the slogan—"You Never Outgrow Your Need for Cereal and Milk." Breakfast cereals are an important carrier of milk in the diet and account for about 15 per cent of fluid milk consumption. More milk is eaten with cereals than with any other single food.

*National Research Council's Recommended Daily Dietary Allowances—Revised 1953.

**1 oz. of breakfast cereal (whole grain, enriched or restored), 4 oz. whole milk, 1 teaspoonful of sugar. Based on composite average of breakfast cereals on dry weight basis.

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long a favored cliché of lazy writers—by quoting figures: "Out of 389,000 nurses employed in the U.S. today, only 14,000 are employed by industry."

LOGAN T. ROBERTSON, M.D., Asheville, North Carolina, and his Occupational Health Services (See *IM&S*, September, 1955) are the subjects of an interesting article, "He Put His Industrial Practice on Wheels," in *Medical Economics*, January, 1956. Of DR. ROBERTSON, the article says "He's an industrial physician whose trademark is three aluminum trailers. With them, he's brought occupational medicine right up to the factory door in dozens of isolated plants from the Atlantic to the Rio Grande."

ELI S. JONES, M.D., President-Elect of the Industrial Medical Association, is the newly appointed member of the AMA Council on Industrial Health, succeeding LLOYD E. HAMLIN, M.D., who retired.

APPLICATIONS for Scientific Exhibit space during the 1956 Philadelphia Industrial Health Conference should be sent to the Chairman of the Scientific Exhibits Committee—ALLAN J. FLEMING, M.D., E. I. du Pont de Nemours & Company, Wilmington 98, Delaware, *as speedily as possible.*

JOHN T. JARRETT, M.D., of Charleston, has been named Medical Officer for the Chesapeake & Potomac Telephone Company of West Virginia. He will head the Medical Department of the company, and will serve as consultant to medical examiners. His services will be on a part-time basis, and he will continue the practice

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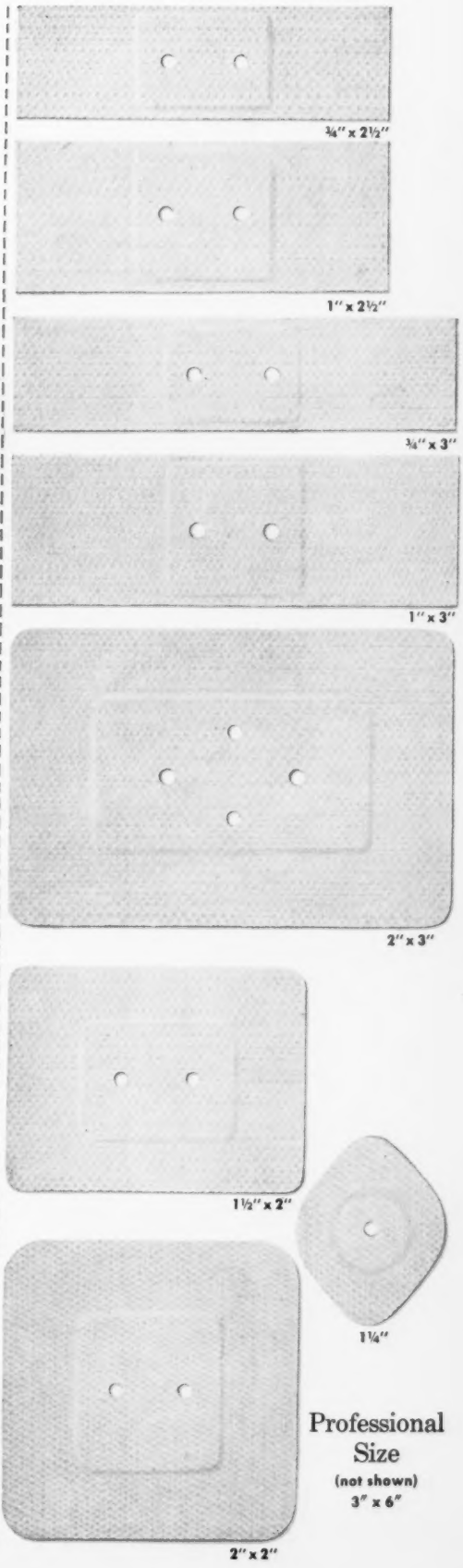

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of his specialty of surgery in Charleston. DR. JARRETT received his M.D. from the Medical College of Virginia in 1938; served in the Medical Corps of the Navy during World War II.

AMERICAN Medical Women's Association announces that a program on Occupational Health for Women will be presented as a part of the 1956 Annual Meeting. The AMWA "plan of work" for 1955-1956 features Industrial Medicine as a theme for special emphasis in national and branch programs.

EDMUND B. SPAETH, M.D., Philadelphia, has an article entitled "Industrial Opthalmology," in the *Journal of the Maine Medical Association*, January, 1956.

KIEFFER DAVIS, M.D., President, Industrial Medical Association, on the recommendation of the Committee on Practice, of which CHARLES F. SHOOK, M.D., is Chairman, has appointed a new committee for liaison with the American Standards Association. KENNETH C. PEACOCK, M.D., is Chairman and A. GIRARD CRANCH, M.D., R. E. ECKHARDT, M.D., and JOHN H. FOULGER, M.D., are among the members.

GUIDING PRINCIPLES for Evaluating Management and Union Health Centers," published in *J.A.M.A.*, July 9, 1955, has been reprinted, with additions and changes, and may now be obtained in reprint form through the Council on Industrial Health, AMA, 535 North Dearborn Street, Chicago 10. These Guiding Principles were adopted by the AMA House of Delegates, December, 1955.

THE Eastern Section of the American Congress of Physical Medicine and Rehabilitation will hold its 1956 meeting in Philadelphia, April 7. HAROLD LEFKOE, M.D., 1006 Medical Tower, Philadelphia 3, is Secretary of the Section. Further information may be obtained from him.

AT A MEETING on February 9, at the Milwaukee Athletic Club, the Medical Society of Milwaukee County presented "Clinical Aspects of the Cardiac in Industry" by RICHARD J. CLARK, M.D., Medical Director, Cardiac Work Classification Unit, Boston, and "Placement of Cardiacs in Industry" by EARLE A. IRVIN, M.D., Medi-

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cal Director, Ford Motor Company, Dearborn, Michigan. DR. IRVIN is President-Elect of the Michigan Heart Association, and Past-President of the Industrial Medical Association.

ROLAND I. PRITIKIN, M.D., Rockford, Illinois is planning a trip to the Middle East Medical Assembly, Beirut, Lebanon, April 7-9, 1956, where he will present a paper. This Assembly will be held on the campus of the American University of Beirut. DR. PRITIKIN is planning a second trip in August and September, and will attend the International Congress for the History of Science at Florence and Milan, Italy, September 3-10, 1956. He has been delegated IMA representative at both meetings.

JOHN E. SUMMERS, M.D., Grand Rapids, in the *Journal of the Michigan State Medical Society* for January, 1956, has a detailed and well-written account of the McIntyre-Saranac Conference on Occupational Chest Diseases held February 6-8, 1955, at Saranac Lake, New York. Only rarely is a national conference on occupational diseases or any other facet of occupational health favored with lengthy reporting in state medical journals or any medical publications besides those in the field of industrial medicine. DR. SUMMERS' report is the exception, and the reporting is exceptional. The pronouncements at Saranac Lake, based upon elaborate laboratory and clinical investigations, hold significant newness for all industrial physicians.

A SYMPOSIUM on Occupational Disease, for general practitioners and industrial medical personnel, will take place Thursday, March 22, 1956, in the building of the Medical Society of the County of Queens, 112-25 Queens Boulevard, Forest Hills. Sponsors are the Medical Society; the Queens County Chapter, Academy of General Practice; the Queensboro Tuberculosis and Health Association; the American Academy of Occupational Medicine; and the Division of Industrial Hygiene, New York State Department of Labor. The Symposium will afford a comprehensive view of current concepts of occupational diseases, their diagnosis, and treatment. It is approved by the American Academy of General Practice for formal credit. The afternoon session begins at 2:00; the evening session at 8:00. For information call or write MISS CHARLOTTE VON DER HEYDE, Consultant in Professional Education, 159-29 90th Avenue, Jamaica, New York.

MICHIGAN INDUSTRIAL MEDICAL ASSOCIATION is holding its Annual Meeting March 1, 1956, at Hotel Olds in Lansing. There will be a full-day program on industrial medicine. An important and unusual accomplishment of the past year was represented by the August, 1955, *Journal of the Michigan State Medical Society*, which was devoted to industrial medicine as follows: "Relationship Between the Physician and Industry"—THOMAS I. BOILEAU, M.D., Detroit; "Industrial Health Education in Michigan"—O. TODD MALLERY, JR., M.D., Ann Arbor; "Controlling Accident Tendency"—HARRY B. BURR, M.D., Administrator of Medical Services, Westinghouse Electric Corporation, Pittsburgh; "How the Physician Can Obtain Help from the Industrial Hygienist"—FRANK A. PATTY, M.D., Detroit; "From Carpet Tacks to Cargo Ships: A Program for the Prevention of Occupational Diseases"—ALBERT E. HEUSTIS, M.D., and JOHN E. SOET, M.D., Lansing; "Responsibility of the Surgeon in the Restoration of the Industrially Injured Patient to His Maximum Earning Power"—W. L. ESTES, M.D., Bethlehem, Pennsylvania; "Vocational Rehabilitation in Michigan"—EDWARD F. SLADEK, M.D., Traverse City; "Legal Situations Confronting Industrial Physicians"—CAREY P. MCCORD, M.D., Ann Arbor; "Acute Pericarditis Associated with Serum Sickness Due to Injection of Tetanus Antitoxin"—DOUGLAS DONALD, M.D., and MARTIN CROTTY, M.D., Detroit; "A Simple Adjunct in the Treatment of Inguinal Hernia"—LLOYD F. TEETER, M.D., Pekin, Illinois; "The Administrator's Place in Psychiatry"—A. P. NOYE, M.D., Norristown, Pennsylvania; "Periodic Health Appraisal: Oral Cancer"—B. E. LUCK, D.D.S., Lansing.

DANIEL L. LYNCH, M.D., 73, died at Roslindale, Massachusetts, February 13, 1956. DR. LYNCH became identified with New England Telephone and Telegraph Company in 1915; later became Medical Director; continued in that capacity until he retired in 1948.

Industrial Mental Health

MENNINGER FOUNDATION announces a Seminar for industrial physicians, to be conducted in cooperation with staff physicians of Topeka State Hospital and Winter VA Hospital, March 5 through 9, 1956, at Topeka, Kansas. The Foundation recently established a Division of Industrial Mental Health, with HARRY LEVINSON, Ph.D., Director. This Seminar is for the industrial physician who is concerned with the health maintenance of a major segment of a company. Its objective is to help him further his understanding of psychological motivation; improve his skills in assessing the emotional aspects of medical problems; familiarize himself with techniques of brief psychotherapy; enlarge his knowledge of psychiatric treatment methods, criteria for referral, and processes of rehabilitation; and develop a systematic point of view with respect to emotional influences on health. The session on brief psychotherapy for industrial physicians will be conducted by LEONARD E. HIMLER, M.D., Chief of Staff, Mercywood Hospital, Ann Arbor, Michigan, and formerly Psychiatric Consultant, General Motors Corporation.

"Because He Lived In It"

THE FOLLOWING Memorial Resolution, adopted by the House of Delegates of the American Medical Association at Boston, December 1, 1955, appeared on page 2 of the Program of the Sixteenth Annual Congress on Industrial Health, held at the Sheraton-Cadillac Hotel, Detroit, January 23-24, 1956. "The House of Delegates notes with sorrow the untimely death on September 27, 1955, of DR. CARL MELANCTON PETERSON, Secretary of the Council on Industrial Health of the American Medical Association. While traveling from a meeting of his Council to a conference in a distant city, CARL PETERSON sustained injuries in an airplane accident from which he did not recover. CARL PETERSON had served the American Medical Association diligently and faithfully for 25 years. He had been the Secretary of the Council on Industrial Health since its inception 17 years ago. During these years his untiring efforts in carrying on the work of the Council and the medical profession gained for him an affectionate esteem which men garner when they demonstrate

For antibacterial protection without retarding healing

Since it's always "open season" on abrasions and lacerations when children play, FURACIN Soluble Dressing fulfills a unique role in preventing or controlling wound infections and permitting undisturbed healing. For routine first aid management of skin lesions in the office—or on home calls—it is unexcelled.

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*Shipley, E. R., and Dodd, M. C.: Surg., Gynec. & Obst. 84:366, 1947.

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the kind of understanding, professional guidance, and leadership which CARL PETERSON possessed. He moved among us in a quiet, unassuming yet confident manner which bespoke faith in his fellow physicians, understanding of the relationship of the physician and his patient, vision in the role of industrial medicine, and unswerving devotion to the fulfillment of those goals to which all of us are dedicated. In the words of one who knew him well, 'The world is a better place because he lived in it.'"

Charles Frederick Yeager, M.D.

THE FAIRFIELD County Medical Association was honored at the Semi-Annual Meeting of the Connecticut State Medical Society on December 8 in the presentation to DR. C. FREDERICK YEAGER of a citation for rehabilitation work by the President's Committee for Employment of the Physically Handicapped. The presentation was made before the Delegates by EDWARD P. CHESTER, Director of Vocational Rehabilitation for the Connecticut State Department of Education and member of the Connecticut Committee for Employment of the Handicapped. The citation reads as follows: "The President's Committee on Employment of the Physically Handicapped—This Citation for outstanding service is conferred upon CHARLES FREDERICK YEAGER, M.D., in recognition of outstanding efforts expended in promoting equal opportunity in employment for the physically handicapped. Attested to by the Committee on Employment of the Handicapped for Connecticut. For the President MELVIN J. MAAS, Chairman, November 21, 1955, Washington." DR. YEAGER is Medical Director of Remington Arms, Inc., Bridgeport. MR. CHESTER remarked that the recipient's interest in the problems of the handicapped began more than 10 years ago when he accepted appointment as a District Medical Consultant for the Bureau of Vocational Rehabilitation, Connecticut State Department of Education. Now serving as the Bureau's Chief Consultant, some 500 handicapped persons are examined under his supervision and placed in suitable employment each year. The District area comprises Fairfield and Litchfield Counties, metropolitan New Haven, and Waterbury. DR. YEAGER is a Fellow of the Industrial Medical Association, and was recently named a member of the Founder's Group in Occupational Medicine, American Board of Preventive Medicine.

—*News Capsule*, January, 1956.

Overseas

SYDNEY CRAWCOUR, M.D., Director of Medical Department, Electronic Industries, Ltd., Melbourne, Australia, has an article in *Manufacturing and Management* (Melbourne), November 15, 1955, entitled "The Problems of the Aged and Infirm Worker in Industry." Following some pertinent comments on existing practices for those in government departments who have reached the retiring age, he outlines the methods used by Electronic Industries, Ltd.: "It is the policy of the company to employ anyone seeking employment irrespective of age or infirmity, old or new Australian, color or creed, so long as the applicant is passed by the Medical Department as fit for the particular job for which he has applied. We have at least 20 different nationalities at present in the employ of this company and medical history forms have been translated into nine different languages and where necessary with illiterates an interpreter is used. A thorough preplacement medical examination is carried out—each employee is examined clinically, has his chest x-rayed, undergoes tests for vision, hearing, etc., and is given injections for immunization against tetanus, and a complete case history is recorded of past illnesses. Careful watch is kept for contagious diseases, and in the case of TB a report is obtained from the Health Department to confirm that the applicant is no longer a 'risk' to fellow employees. Applicants who have worked previously in jobs where they have been subject to the hazard of silicosis (for example, many new Australians who have been unwilling workers under bad conditions in mines in Europe) are sent for a special check by the State Health Department, which investigates such cases. All x-ray investigation is made on the company's time and has been going on for over 10 years, so that we feel we are playing our part in wiping out TB in the community. All employees are re-rayed annually. With a large organization such as Electronic Industries, we are able to find suitable employment for nearly all applicants—it is a rare occasion when one is rejected. We employ the halt, the lame, and the deaf (our industry does not lend itself to employing the blind). We have in our employment amputees, and people crippled as a result of accident, polio or other diseases. Our experience is that workers with disabilities prove good and conscientious employees; they appreciate that they have been 'fitted in' to a job within their capabilities and usually are better timekeepers than their fellows. Employees who are crippled or on crutches are allowed latitude in starting and finishing time so that if they so desire they miss the rush of peak traffic. Employees with poor vision are relegated to jobs from which their lack of normal vision does not bar them . . . . In conjunction with the personnel department we endeavor to select applicants we consider are likely to fit in and settle to the job with the company. Electronic Industries has built up a solid staff, many of whom have already taken their long service leave. Our aim is to increase the number of 'old hands' and this is being done by good employer-employee relationship, constant employment, greater factory efficiency and mechanization, and improved amenities. The Medical Department keeps an eye on the health of the employee and when necessary he is advised to consult his family doctor, or referred to a hospital. Executive staff are given an annual check-up as part of the department's service and more frequently if there are indications that it is necessary. When employees reach the middle sixties we start to plan for the future place in the company—if they are fit we certainly do not start to consider the date when they must terminate their employment."

Medical Department Filmstrip

A PLANT HEALTH PROGRAM" is the title of a filmstrip, in black and white, with sound, running 14 minutes, prepared by and available from the U.S. Public Health Service. The pamphlet description says that this filmstrip "tells the story behind employee health services. By taking you to a printing plant in Louisville, Kentucky, to watch an employee health program in operation, it helps to answer such questions as: Why are employee health programs being established? What services do they provide? What do they accomplish? . . . . Startling, tangible proof of the value

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A major cause of absenteeism, dysmenorrhea represents a serious economic handicap to the more than one in three menstruating women with this complaint. PRANONE produces "brilliant results," and more physiologic relief of dysmenorrhea,* significantly reducing absenteeism from this cause.

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*Parsons, L., and Tenny, B., Jr.: M. Clin. North America *34*:1537, 1950.

CL-J-51

of an employee health program is presented in statistics showing reductions in the number of accidents, in the workmen's compensation rate, and in the number of working days lost due to illness. In this printing plant, where production deadlines must be met, the employee health program is here to stay. The men in the front office and the men on the production line give it a five-star rating: better health; higher morale; increased production; steadier earnings; an improved community life." It is no secret that the printing plant in question is that of the Fawcett-Dearing Printing Company, which turns out more than a million complete magazines every day of the year excepting only Christmas, and where GRADIE ROWNTREE, M.D., is Medical Director. The filmstrip is designed to be of special interest and importance to management, labor, and the health professions. A limited number of prints are available for loan from state health departments. Prints may also be purchased from United World Films, Inc., 1445 Park Avenue, New York 29, for $5, including the recording. The filmstrip has been cleared for television. Further information may be obtained by writing to the Occupational Health Program, Public Health Service, Washington 25, D. C.

Conference in Miami

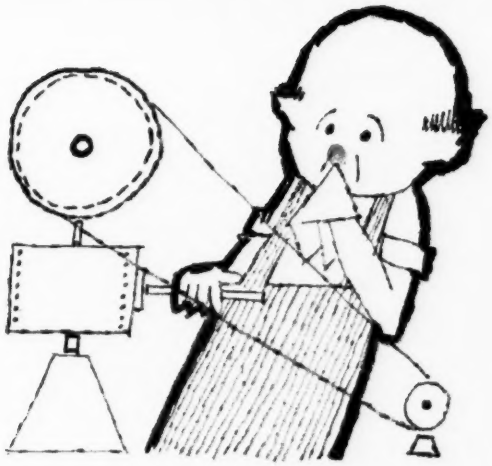
UNIVERSITY OF MIAMI School of Medicine, Coral Gables, Florida, in conjunction with the University of Havana, Cuba, proposes to present in Miami, September 3-8, 1956, a Conference on Occupational Medicine and Toxicology. The language of the sessions will be Spanish; the Conference is intended to draw participants and lecturers primarily from the Latin American countries, although industrial physicians from the United States will be invited. In addition to the obvious timeliness and value of a Conference of this kind from the educational and scientific standpoint, it can easily play a great part in furthering friendly relations and good will between the industries and peoples of the countries of the Western Hemisphere. A difficulty in assuring the participation of key people from each Latin American country is that their expenses will have to be paid, and the University has no funds for that purpose. The organization of the meeting is being conducted by a committee consisting of DRS. WILLARD MACHLE, WILLIAM B. DEICHMANN and RALPH JONES, JR., of the University of Miami, and RAFAEL PENALVER BALLINA, VICENTE PARDO CASTELLO and FRANCISCO LANCIS Y SANCHEZ, of the University of Havana. PEDRO KOURI, Dean, Havana University, and HOMER F. MARSH, Ph.D., Dean, Miami University, will be the Conference Co-Chairman.

Seventh Discussional

INSTITUTE of Industrial Health, University of Michigan, was the scene of the Seventh Ann Arbor Discussional, January 20-21, 1956. Under the long-established policy governing these discussionals, they are "restricted" as to what was said and who said it. Permissible, however, is the statement that the subjects discussed—and sometimes argued—at this one included among others the administrative economics of industrial medicine as related: to certain government bodies, to safety efforts, to medical, legal and compensation matters, and to management policies, e.g., promotion examinations, etc. Industries of all kinds—steel, chemicals, oil, glass, soap, utilities, automobile manufacturing, printing, metal mining, coal mining, to the extent of near 6,000,000 employees—were represented, as were organized medicine, and organized labor.

Seventh Annual Discussional, Institute of Industrial Health, University of Michigan, January 20-21, 1956

Front Row—William A. Sawyer, M.D.; R. W. Ian Urquhart, M.D.; Russell G. Birrell, M.D.; Thomas W. Nale, M.D.; Bryce B. Reeve, M.D.; H. M. Harrison, M.D.; C. F. Shook, M.D.; B. Dixon Holland, Colonel, M.C.; A. N. McKillop, M.D.; Merritt F. McGavin, M.D.; Max R. Burnell, M.D.; Warren F. Draper, M.D.; Middle Row—Ronald F. Buchan, M.D.; H. M. Roebber, M.D.; Carey P. McCord, M.D.; S. Charles Franco, M.D.; E. A. Irvin, M.D.; Hans W. Lawrence, M.D.; Edward C. Holmblad, M.D.; John H. Hege, M.D.; D. J. Lauer, M.D.; R. B. Robson, M.D.; Ralph F. Schneider, M.D.; Daniel C. Braun, M.D.; Top Row—George F. Wilkins, M.D.; Elston L. Belknap, M.D.; Otto Tod Mallery, Jr., M.D.; W. P. Shepard, M.D.; Earl F. Lutz, M.D.; O. A. Sander, M.D.; Dudley A. Irwin, M.D.; F. R. Griffin, M.D.; John R. Hall, Jr., M.D.; Clarence D. Selby, M.D.; Leonard Arling, M.D.; O. M. Derryberry, M.D.; Logan T. Robertson, M.D.; Arthur Vorwald, M.D.; Harold H. Gay, M.D.; Joseph T. Noe, M.D.; N. J. Roberts, M.D.; Jerome K. Brasch; Warren A. Cook; E. S. Jones, M.D.; Gradie R. Rowntree, M.D.; Clark D. Bridges; William G. Fredrick, Sc.D.; Seward E. Miller, M.D.; Fred D. Cruickshank, M.D.; William F. Ashe, M.D.



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Ascorbic Acid	20 mg.
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dosage: Adults—1 to 2 tablets three or four times a day with food or immediately after meals. Children—1 tablet two to four times a day.

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not a mephenesin derivative

FLEXIN provides superior and long lasting—up to 6 hours—spasmolysis of voluntary muscle in low back syndromes, fibrositis, strains, sprains, and in noninflammatory rheumatic and arthritic disorders.

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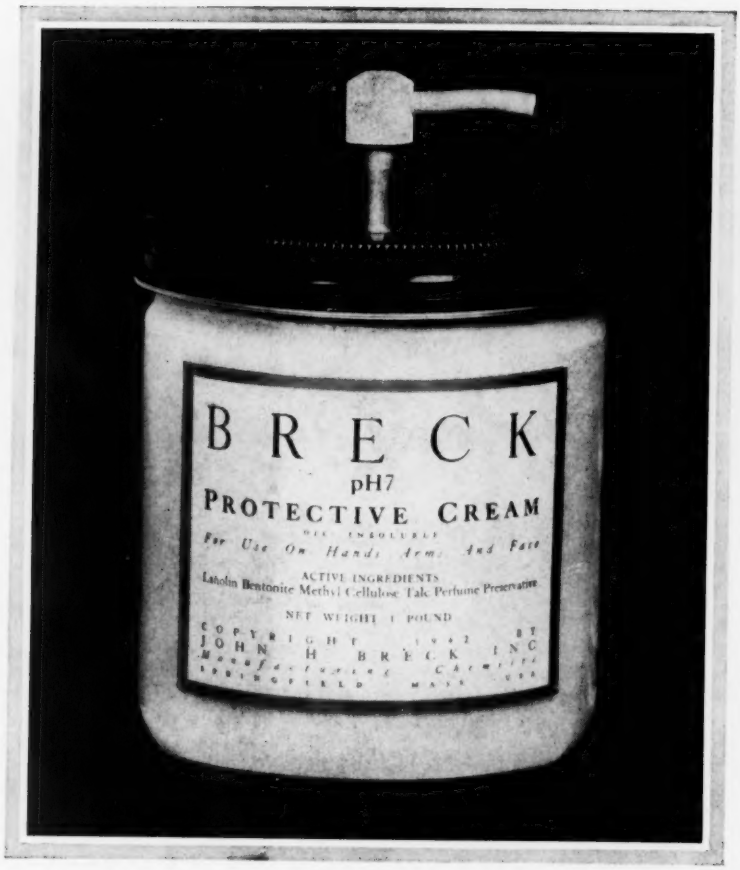

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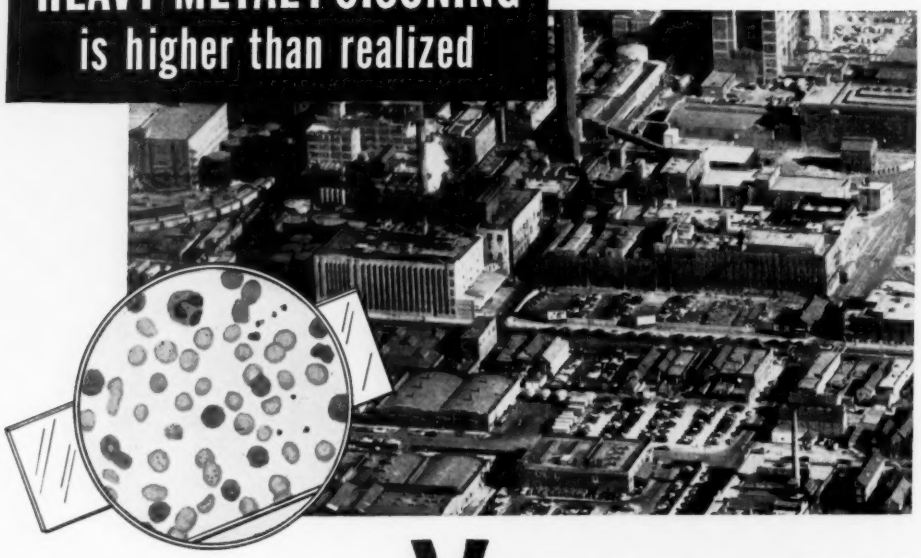

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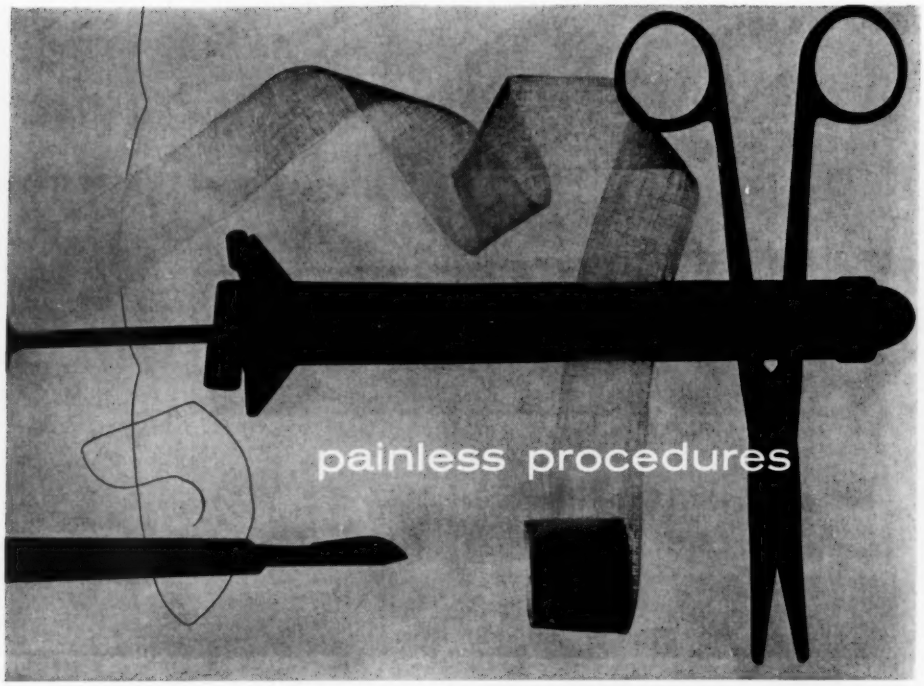

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Cream, 0.5%, in 1¼-ounce tubes.
Ophthalmic Ointment, 0.5%, in ophthalmic-tip tubes of 4.0 Gm. each.

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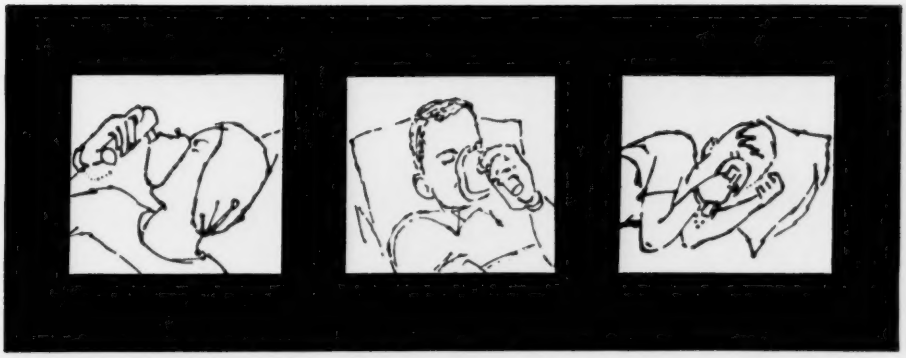

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(equivalent to 50 mg. ascorbic acid)	
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* U.S. Pat. 2,691,662

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2. Roskam, J., VanCawenberge, H.: Abst. in J.A.M.A., 151:248 (1953).
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5. Spies, T.D., et al.: J.A.M.A., 159:645 (Oct. 15, 1955).

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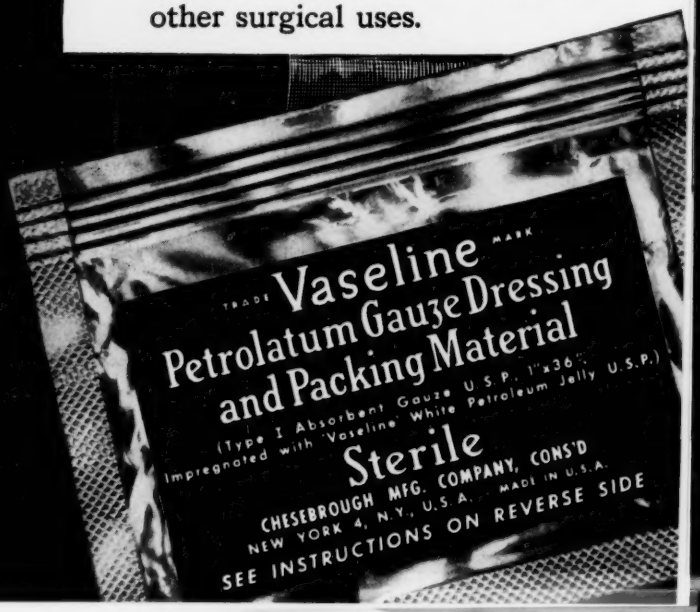
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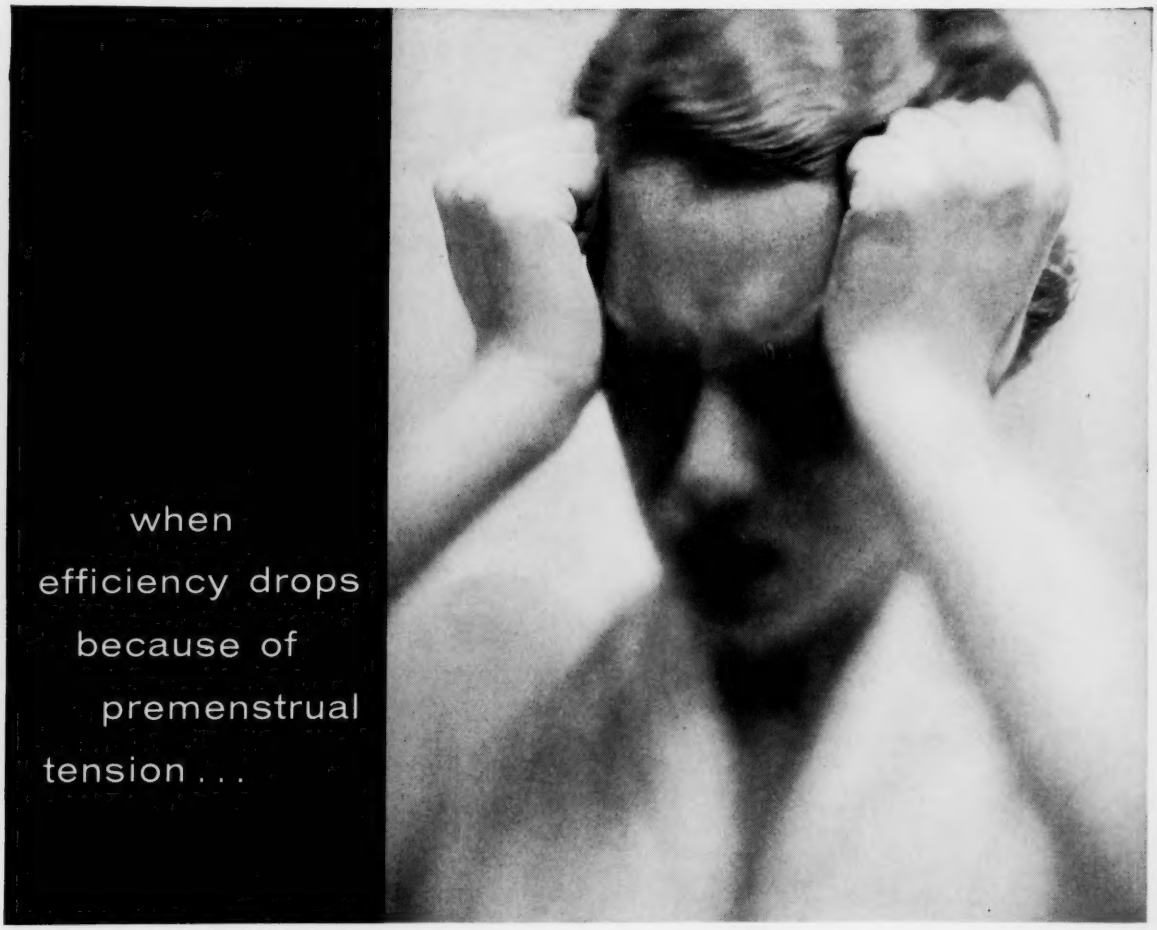

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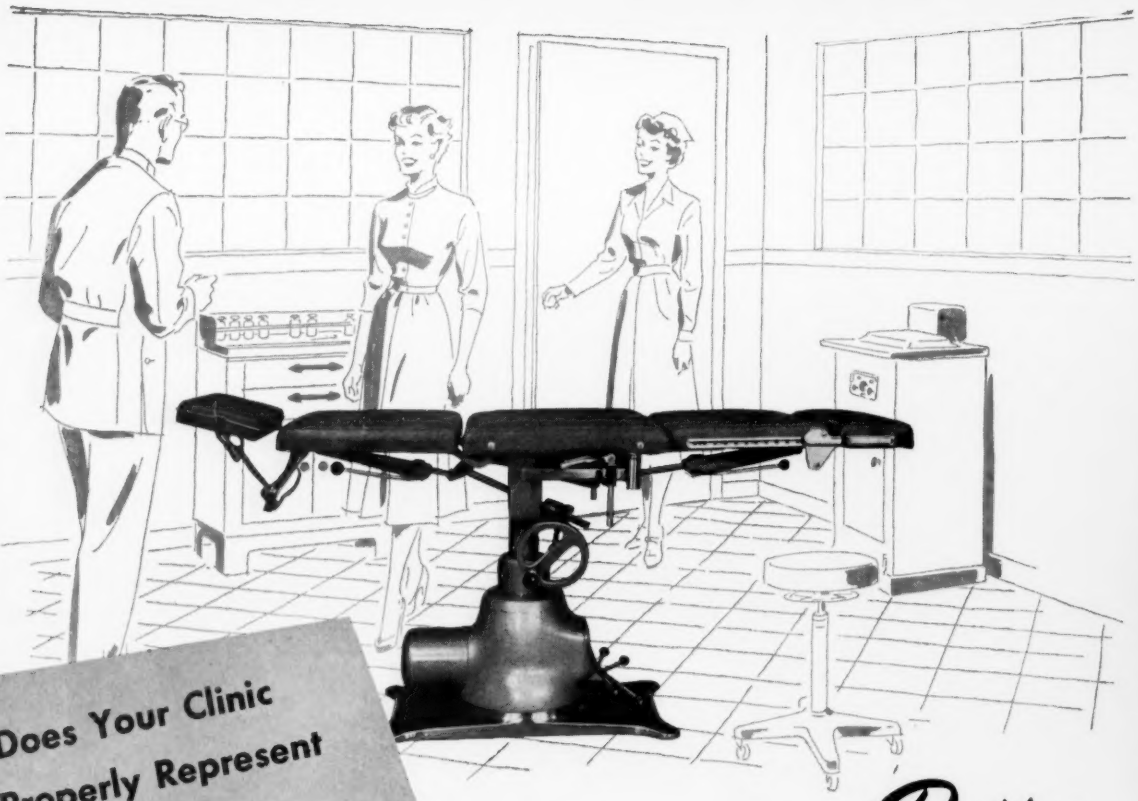

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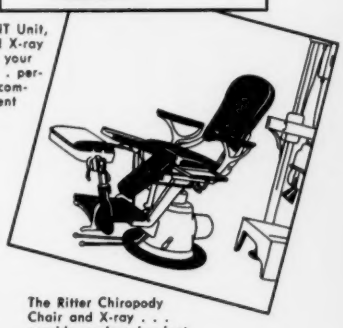

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Four times more effective than hydrocortisone, and, on the basis of preliminary findings,[2,3] superior in potency even to prednisone (cortisone analog), STERANE is also relatively free of such hormonal side effects as edema, hypertension, or hypopotassemia.

Supplied: White, 5 mg. oral tablets, in bottles of 20 and 100. Pink, 1 mg. oral tablets, in bottles of 100. Both are deep-scored and in the distinctive "easy-to-break" size and Pfizer oval shape.

References: 1. Bunim, J. J., et al.: J.A.M.A. 157:311, 1955. 2. Forsham, P. H., et al.: Paper presented at First Internat. Conf. on Prednisone and Prednisolone, New York, May 31-June 1, 1955. 3. Perlman, P. L., and Tolksdorf, S.: Scientific Exhibit presented at A.M.A. Annual Meet., Atlantic City, June 6-11, 1955.

PFIZER LABORATORIES Division, Chas. Pfizer & Co., Inc. Brooklyn 6, New York

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A Laboratory and Clinical Report on Adrenosem® Salicylate

(BRAND OF CARBAZOCHROME SALICYLATE)

History

The first investigation of a hemostat with an action comparable to Adrenosem Salicylate was made by Derouaux and Roskam[1] in 1937. They reported that an oxidation product of adrenalin, adrenochrome (which has no sympathomimetic properties), has prompt hemostatic activity.

It was further found that various combinations of adrenochrome, notably the oxime and semicarbazone, produced stable solutions. But, these were so slightly soluble that sufficient concentration could not be obtained for practical therapeutic use. By combining these adrenochrome compounds in a sodium salicylate complex a stable, soluble form can be obtained. This complex has been given the generic name, carbazochrome salicylate, and is supplied under the trade name Adrenosem Salicylate.

Roskam, in his study entitled "The Arrest of Bleeding,"[2] enumerates "the drugs whose efficaciousness as hemostatics have been proved by accurate methods in experimental animals and in healthy men as well. . . . One is the monosemicarbazone of adrenochrome [Adrenosem Salicylate]."

Chemistry

Adrenosem Salicylate is a synthetic chemical. The full chemical name is adrenochrome monosemicarbazone sodium salicylate complex.

Pharmacology

Although it is chemically related to epinephrine, Adrenosem Salicylate has no sympathomimetic effects. It does not alter blood components, nor does it affect blood pressure or cardiac rate.[2-7]

(* U.S. Patent 2,581,850)

Sherber, in an early study,[3] concludes that Adrenosem Salicylate* "is a potent antihemorrhagic factor in those conditions in which the integrity of the smaller vessels is interrupted, and is superior to any similar material that is now available."

He continues, "From our experience it appears that adrenochromazone complex is indicated in preventing vascular accidents incident to hypertension; in maintaining small vessel integrity; in the preoperative preparation where oozing from a vascular bed is anticipated, as in tonsillectomies, adenoidectomies and prostatectomies; and as an adjunct in the treatment of bleeding from such surgical procedures."

Adrenosem Salicylate may be administered simultaneously (but separately) with any type of anesthetic, anticoagulant, or vitamin K and heparin.

A Unique Systemic Hemostat

Clinical investigators[2-7] are in agreement that Adrenosem Salicylate controls bleeding and oozing by decreasing capillary permeability and by promoting the retraction of severed capillary ends. It aids in maintaining normal capillary integrity by direct action on the intercellular "cement" in capillary walls. The interesting work of Fulton[8] confirms this. Adrenosem Salicylate, since it is not a vasoconstrictor, has no effect on large severed blood vessels and arterioles.

Adrenosem Salicylate is being used both prophylactically and therapeutically in thousands of hospitals, and in virtually every type of surgical procedure. It has also proved most useful in dental surgery.[7]

Owings reported on the use of Adrenosem Salicylate in controlling postoperative adenoid bleeding in 102 cases.[4] "We have used 2½ mg.

(½ ampule) intramuscularly, 15 minutes before anesthesia for children and 5 mg. (1 ampule) for adults." In only one patient did bleeding occur. Three others showed red blood from the nose and mouth. These patients "were then given 5 mg. intramuscularly, with prompt and complete control. We have also noticed that bleeding stopped more promptly on the operating table."

This is a 1% incidence of postoperative bleeding using Adrenosem Salicylate preoperatively, compared to an incidence of 10% postoperative bleeding in all cases taken from previous records, without Adrenosem Salicylate medication.

Peele reports on the use of Adrenosem Salicylate in treating 178 patients with 24 different conditions.[5] The drug was first used to control postoperative hemorrhage from the adenoid region. He adds: "The results were so dramatic that since that date [1953] Adrenosem Salicylate has been used postoperatively to reduce bleeding from all otolaryngologic and bronchoesophagolic procedures, to treat postoperative hemorrhage from the tonsil and adenoid regions, and to treat selected cases of epistaxis."

The effectiveness of Adrenosem Salicylate in controlling bleeding and oozing in 330 patients is reviewed by Bacala.[6] "Our experience of the effect of carbazochrome salicylate on 317 surgical indications and 13 obstetricogynecological conditions, has been therapeutically encouraging and successful for the control of capillary bleeding. Foremost among the cases studied were 223 tonsillectomies definitely benefited by this metabolic hemostat, making a diminution of the control incidence of posttonsillectomy bleeding of 19.8% down to 7%. It has also been found useful in gastro-intestinal bleeding, cataract extraction, epistaxis, incisional seepage, trans-urethral prostatectomy, menometrorrhagias, cervical ooze, antepartum and postpartum bleeding, threatened abortion, and prevention of capillary hemorrhages during hedulin or dicumerol therapy."

Side Effects

All investigators concur that, at recommended dosage levels, Adrenosem Salicylate is free from toxic effects. No cumulative effects attributable to the drug have been reported.

The only side reaction noted has been a transient stinging sensation in the area of injection when Adrenosem Salicylate is used intramuscularly. As one investigator comments: "The brief discomfort which attends the injection of Adrenosem into the gluteal region has not been a significant problem in children or adults as originally anticipated."[5]

Indications

Idiopathic purpura, retinal hemorrhage, familial telangiectasia, epistaxis, hemoptysis, hematuria.

Postoperative bleeding associated with:
tonsillectomy, adenoidectomy and
nasopharynx surgery;
prostatic and bladder surgery;
uterine bleeding;
postpartum hemorrhage;
dental surgery;
chest surgery and chronic pulmonary bleeding.

Dosage

For recommended dosage schedules, please send for detailed literature.

Supplied

Ampuls: 5 mg., 1 cc. (package of 5).
Tablets: 1 mg. S.C. Orange, bottles of 50.
Tablets: 2.5 mg. S.C. Yellow, bottles of 50.
Syrup: 2.5 mg. per 5 cc. (1 tsp.), 4 ounce bottles.

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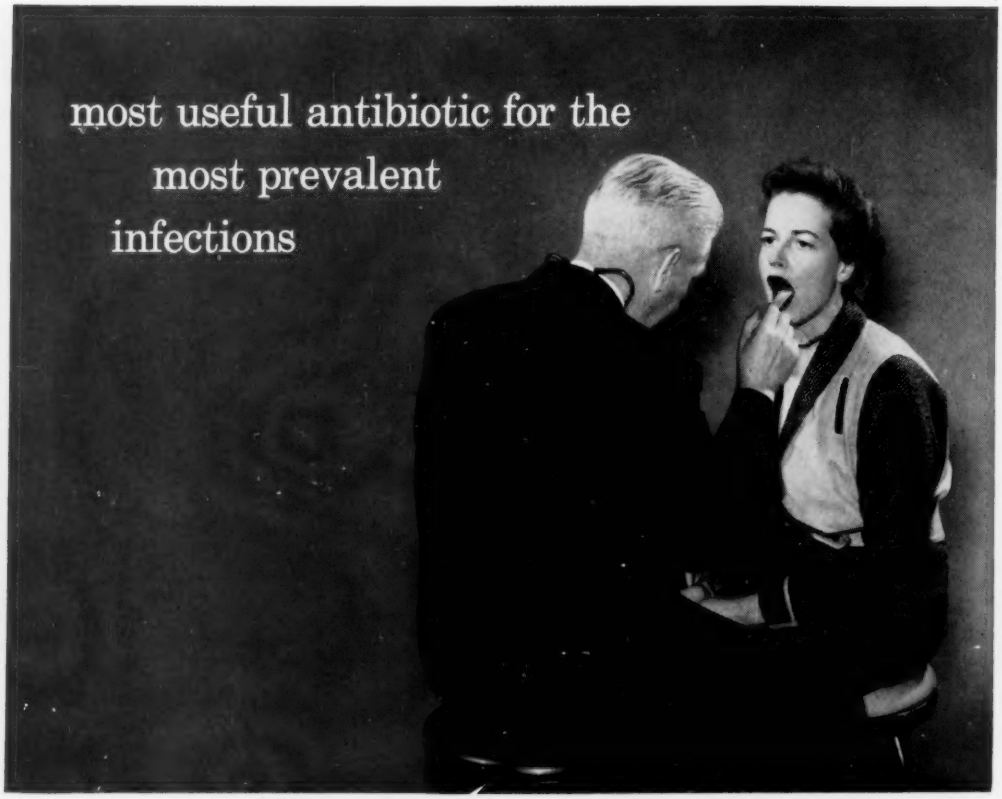

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INDUSTRIAL MEDICINE AND SURGERY

MARCH, 1956

The Economics of Preventive Medicine

—A SYNTHESIS OF OPINIONS

FRANK A. CALDERONE, M.D., M.P.H.
Consultant in Medical Industrial Relations, Great Neck, Long Island

POSSIBLY the most important single medical economic problem before the American people today is how to decide who properly should pay for the medical care of the American worker and his family. With 65 million men and women gainfully employed in the United States, it is obvious that health-care practices and conditions in national industry are of profound importance—not only to the worker and to those directly dependent on his income, but also to the economic well-being of the nation. Indeed, if one includes the workers' families, by far the largest segment of our total population—165,000,000—is involved.

As health programs broaden, the expense will increase. Who will pick up the increased tab? The answer involves far more than economics. Fundamental health policies and procedures will be affected by the final decision.

Consequently the matter should not be allowed to drift. Rather, the American people should be given an opportunity to know the thinking and the recommendation of informed leadership so that intelligent decisions may be made which will best serve the public interest.

But how is leadership itself to become informed, and thus be enabled to make intelligent recommendations as applied to industrial health programs? It is necessary to synthesize the experience and thinking of as broad a cross-section as possible of those actively engaged or interested in the several fields pertaining to industrial health.

I have just completed a survey which was not made on a quantitative basis of sampling a cross-section of the public, but was made, rather, on the opinions and answers of those immediately concerned with industrial medicine: leaders in the fields of industry, labor, medicine and education. The results of my study point up the depth of the problem involved, since the offered solutions are many and varied; but one fact emerges clear and uncontested: the problem of the cost of medical care for the American people—in this case, specifically, the 65 million industrial workers of our country—is a matter of deep concern to all these elements of our society.

It was with these thoughts in mind that I directed my queries along these lines:

What should be the content of an industrial health program?

Who will determine policies and control practices?

What safeguards will be established to insure that the soundest practices prevail?

What will be the nature of the medical organization set up to service this rapidly expanding field?

How should the cost of preventive medical care of employees in American business be paid?

Who should assume leadership in guiding the type of services to be provided?

What steps can be taken to insure more attention to personal health care by the individual worker?

How should we solve the problem of chronological versus physiological age as the basis of employment separation?

How can we insure that expanded programs do not result in depersonalized service?

What should be the role of the industrial health specialist in applying the soundest medical principles to achieve the desired end result?

Areas of Inquiry

I POSED these questions by letter to 1,034 individuals representing the highest executive echelons in industry, in the insurance field (both private companies and voluntary associations such as Blue Cross and Blue Shield), in state health departments, in government health agencies, and in unions. Also included in my lists were heads of state medical societies, presidents of foundations, deans of medical schools, editors of

DR. CALDERONE is President of the OCCUPATIONAL HEALTH INSTITUTE.

medical publications. In addition, I personally conferred with outstanding leaders in the fields of business, labor, medicine, and management engineering.

My queries met with intense interest. Men whose time is carefully budgeted spent hours with me in thoughtful conference and discussion; I received hundreds of letters, some of them practically dissertations.

That there were both agreements and diversities of opinion one may well imagine. In order to establish some patterned basis for drawing conclusions, I have broken down the notes of each conversation and the contents of every letter into idea categories, types of suggestions and recommendations, and factual data classifications.

Now for a completely factual and objective report of the survey findings. After that I will offer some recommendations.

Table I serves to show the distribution of the answers to the original query by categories based on the vocation or profession of the respondent. The group categories have been divided into groups (a) predominantly lay, and (b) predominantly medical. It is interesting to note that in the lay group, 93% of the responses were made by the presidents or the heads of industries, labor organizations, insurance companies, and foundations. The remaining 7% of the answers were made by Medical Directors in these organizations. In the medical respondents' group—health departments, deans of universities, editors of medical journals, and presidents of medical societies—81% of the responses were medical, and 19% were non-medical.

Table II serves to show the interest displayed by these two groups, expressed as "Thoughtful," "Guarded," or "Noncommittal." It is interesting to note that in both the lay and the medical groups, 54% of the answers were truly thoughtful.

Table II indicates the degree of interest, i.e., the "Thoughtful," "Guarded," and "Noncommittal" by category group. It is interesting to observe that practically all of the letters from unions were extremely thoughtful and discursive. The insurance companies, including Blue Cross and Blue Shield, were most interested and thoughtful. These, by the very nature of their activity, were able to take an across-the-board view, based on a wider perspective than is afforded to management, labor, or medicine alone.

Table IV indicates the geographical areas from which responses were received, divided into predominantly medical and predominantly lay groups.

Areas of Agreement

FIRST let us consider areas of agreement—for there were some points on which practically all were in accord.

As to the vital importance of employee health to the national economy, there was no dissent. In the business world, both lay and medical opinion agreed that industrial health programs pay dividends to industry as well as to the worker.

Deans of medical schools termed industrial health care a well-recognized division of modern medicine that should be further developed.

Heads of state medical societies recognized the importance of industrial medicine.

Health department officials were unanimous as to the importance of the field and its problems. Typical comments were: "The health of the worker is industry's greatest asset," and "The people realize they need a healthy nation and are determined to get it."

The replies from union officials show that they attribute the highest values to worker health. The worker's health was termed of importance to industrial efficiency equal to that of machines,

TABLE I.
VOCATIONAL GROUP CATEGORIES

Lay Answers	Letters Sent	Answers:	%	Medical Respondents	Lay Respondents
Schedule A: Predominantly Lay Respondents:					
Industry	540	110	20%	5%	95%
Unions	100	19	19%	0%	100%
Insurance	106	34	31%	12%	88%
Foundations	32	17	41%	18%	82%
	778	180	23%	7%	93%
Schedule B: Predominantly Medical Respondents:					
Health Departments	54	20	37%	60%	40%
Universities	66	35	52%	100%	0%
Editors	85	19	23%	74%	26%
Medical Societies	51	24	47%	74%	26%
	256	98	38%	81%	19%
Total:	1034	278	27%		

TABLE II.

	Thoughtful	Guarded	Noncommittal
Schedule A: Lay Responses:			
Industry	54	23	23
Unions	15	1	3
Insurance	20	4	6
Foundations	2	4	8
Government and Health Departments	3	5	0
Universities	0	0	0
Editors	1	2	2
Medical Societies	2	2	2
182	97 (54%)	41 (22%)	44 (24%)
Schedule B: Medical Responses:			
Industry	5	5	0
Unions	0	0	0
Insurance	3	1	0
Foundations	2	1	0
Government and Health Departments	7	3	2
Universities	14	13	8
Editors	7	2	5
Medical Societies	14	3	1
96	52 (54%)	28 (29%)	16 (17%)

TABLE III.

	Thoughtful	Guarded	Noncommittal
Unions	80%	5%	15%
Insurance	67%	15%	18%
Medical Societies	67%	21%	12%
Industry	54%	26%	20%
Government and Health Departments	50%	35%	15%
Editors	42%	21%	37%
Universities	40%	37%	23%

TABLE IV.

	Medical	Lay
New England	48	9
Middle Atlantic	36	71
East North Central	12	37
West North Central	11	13
South Atlantic	21	14
East South Central	7	2
West South Central	5	3
Mountain	3	3
Pacific	5	7

organizations, and executives. Correspondents were of the opinion that health care expenditures not only effect great savings through increased production, but also maintain the purchasing power of the worker and his family.

Criteria for Retirement

CONCERNING the tremendous problem of chronological *versus* physiological criteria as the basis for mandatory retirement, there was also substantial agreement.

In the business world, executive opinions, both lay and medical, were in accord that compulsory retirement should depend not on age, but on the individual's ability to do his job.

Deans of medical colleges likewise felt that retirement should be governed by physiological, rather than chronological, factors. One respondent pointed out that, although there is no physiological yardstick comparable in accuracy to the calendar, still criteria might be established to support the fact that many workers past 70 or even 75 are more useful than others at 55 or 60.

Heads of state medical societies also favored the physiological approach. One respondent pointed out that not only will workers be happier if allowed to work as long as possible, but also that the whole economic system will benefit thereby.

Health department officials indicated that the retirement problem is a very difficult one. One thought that industry, insurance companies and occupational medicine should be represented in setting up policy. Another believed that services of industrial health and geriatrics specialists are needed to solve the problem.

Insurance executives seemed primarily concerned with financial security of the worker after retirement, irrespective of cause.

The union officials who replied on this point were all in favor of voluntary rather than mandatory age retirement—which was contrary to what some other respondents indicated they believed union thinking to be. The point of view was expressed that the experience of the older worker outweighs his disadvantages of age. However, they were emphatic that financial provision should be made for the retired man at the time he needs it most.

Kind of Care

THE desirability of personalized medical service in industrial health care was the third point of substantial agreement.

Business leaders indicated that management should be responsible for the creation of a personalized service, not only by providing an adequate staff, but also by taking real and properly-oriented interest in the administration of services provided.

The majority of deans of medical schools urged the desirability of personalized service. One dissenter felt that the physician-patient relationship is overstressed and that group practice is as satisfactory to the patient as individualized care.

Responses from heads of state medical societies were unanimous in stressing the importance of personalized service. One made the interesting observation that good doctor-patient relationships would minimize the demand from labor organizations or government agencies for services which the family physician is best qualified to render.

Health department executives expressed positive views about personalized service, and one respondent advocated "voluntary team work between disciples of individualism and mass production" as the path to optimum results.

The insurance field was unanimous and emphatic that personalized service is vital. The president of one company declared that no health program sponsored by industry or government can take the place of the family physician because, in his opinion, functional situations rather than organic disease constitute a great part of medical care needs.

Union officials were equally united on the prime importance of personalized care. But this group stated that medical programs sponsored by private groups and industries and labor medical centers are often more personal in treatment than the personal physician, charging high fees, who is seldom consulted. This group felt that safeguards should be erected to guard against depersonalization by means of some patient control over any health or welfare plan. It was advocated that leadership groups from the medical profession, and Federal and state agencies, see to maintaining personalized service. The consensus was that it is important to maintain meaningful free choice by patient and physician under any health plan.

Two reactions to this phase of the problem came from foundation officials—both interesting. Said one: "Doctors have lost their tact and kind-

ness; medicine is becoming depersonalized." Commented the other, "I would pray for the return of the relationship of the family doctor to his patient . . . ."

Educational Activities

THERE WAS general agreement on the importance of educational activity relative to health care. However, respondents differed as to who should carry out such a program. Business considers it a function of industry to be furthered by printed material and personal contact. Union opinion, though not minimizing the value of printed material graphically illustrated, favors a program jointly administered by industry and labor, and feels that some of the best education comes from the health plans themselves and from those benefiting thereby.

Deans, medical society heads, and health department officials naturally emphasized the place of the medical profession in education. However, there were differing opinions as to just where the obligation lies. Some deans felt organized medicine should take the lead, while another belief was that this was the responsibility of the individual company's Medical Director. The latter viewpoint found support also in some medical society leadership. Some health department opinion favored joint representation of industry, insurance companies, and organized medicine in working out programs.

The idea of health education by insurance companies also found some support among deans, and was particularly stressed by foundation officials and consultant engineers.

So much for the areas of practical agreement. The subjects which evoked conflicting opinions in greater or lesser degree present several noteworthy points.

Preventive Medicine

PREVENTIVE medicine, its importance and place in industrial health care, called forth diverse views. Majority opinion among business executives, health department officials, and representatives of unions agreed on its importance. Business in general thought in terms of pre-placement and periodic examinations. Health department officials stressed that preventive medicine can reduce much steeper costs of treatment, as well as reduce operating costs due to replacement and turnover of labor. Unions emphasized its importance to "worker well-being" and advocated its much wider practice. However, there were some doubts and dissents within these generally affirmative groups. Some businessmen were fearful lest industrial preventive medicine infringe on the individual's rights, and some doubt was expressed by them as to how much of the costs industry should bear. Unions, too, recognized the attendant expense.

Heads of state medical societies in general reacted negatively to the value and practicality of preventive medicine. Among the objections they voiced were: excessive cost of immunization and screening tests in relation to positive cases found; unwisdom of attempting to distinguish between preventive and curative medicine; the inability to provide preventive care under insurance principles. In general there was expressed anxiety that preventive medical programs would turn into curative programs and thereby pave the way to the control of medical practice.

Responses from Blue Cross and Blue Shield groups agreed that preventive care is part of complete coverage within health programs and is being so accepted. But opinion differed as to how it should be handled. Some advocated voluntary prepayment of a small additional premium to cover preventive care. Others believed such prepaid programs would increase malingering. Still others felt it to be more economical for the individual to pay for such care directly rather than through insurance.

One respondent, in answer to the original query, stated, "We feel that the points which your letter raises are so important that the unpaid trustees have agreed to devote a three-day conference to a discussion of these problems." It is interesting that five months later this three-day conference was held. Shortly thereafter, for the first time in the history of Blue Cross plans, there was inaugurated a preventive medical benefit plan directed towards the annual periodic physical examination on an insurance basis.

The Role of the Industrial Health Specialist

THERE WERE various replies concerning the importance and proper function of the industrial health specialist. Although not usually in basic conflict, they reflected important diversity of thinking.

Among business executives, insurance representatives, and unions, there was a general feeling that the industrial health specialist's activities should encompass more than just plant health care. Business views him as an administrator as well as a doctor, with liaison functions between management, the plant medical program, and community health. Insurance executives visualize him as a liaison consultant between the medical profession, the public, and industry, and as the ideal person to work with clinics and in areas of combined preventive and curative medicine. Unions feel he can be of particular value in guiding labor and management in the installation and planning of health programs and insurance programs.

From deans of medical schools came the opinion that the industrial health specialist should apply preventive measures within his own plant and collaborate with comprehensive care groups. They believe that he should have public health knowledge and be a master of effective patient-physician relationships since he must deal both with groups and with individuals, and must combine assembly-line tactics and individualized methods.

Replies from heads of medical societies viewed the role of the industrial health specialist as including inauguration of safety programs and sat-

isfactory sanitary conditions, and carrying on a program of health education within the plant. This group felt that his qualifications should include professional and technical knowledge, plus the ability to apply the best medical principles to the industrial field. Only one respondent in this group mentioned annual physical examinations as a part of any planned preventive medical work.

Present-Day Industrial Health Programs

DESCRIPTIONS of present-day industrial health programs revealed a great diversity of practice and opinion.

Let us consider practice first. The range is from a company which gives physical examinations to its executives only, to one with a wide range of free service to all its workers, including periodic and special physical examinations, laboratory tests, immunization, physiotherapy and electronic forms of therapy, at-work checkups for recuperating employees, emergency treatments, and personal consultations. Other companies' activities fall between these extremes. Preplacement examinations and general first aid covering occupational injuries and disease are common practice. Employees at most companies are covered by Blue Cross and Blue Shield. Some companies employ part-time physicians or nurses to give emergency care only.

Opinions concerning effectiveness of present programs reflected the greatest divergence between business and union executives. The former all felt that their present programs offered protection to the worker; and, although some company doctors felt that present programs were insufficient, they had faith in future developments.

Unions, however, had many criticisms. Intramural plant programs were described as too narrow in scope, as failing to include preventive care and early diagnosis, and as having insufficient medical personnel and inadequate clinical facilities. Extra-mural programs covered by insurance were similarly described as narrow in scope, as failing to include preventive care, as lacking rehabilitation services, and as having inadequate coverage for dependents, and retired and unemployed persons. Union opinions also pointed, in this area, to lack of control over the quality of services, lack of personalized physician-patient relationship, and insurance benefits so limited as to be practically meaningless.

From this quarter there was also criticism of the unions' own health plans as competing among themselves by negotiating for ever higher fee schedules. Nevertheless, despite the unions' complaints about present programs, one official quoted with approval the opinion of the Los Angeles Conference on Health and Welfare to the effect that discussion of weaknesses in present plans should not obscure the fact that they provide a greater measure of security than has ever before been available for workers and their families.

State medical society heads in general did not comment on this point, but one opinion was that in-plant medical services increased absenteeism and operating costs.

Without commenting on the degree of satisfaction with present programs, health department officials' replies stressed the over-all importance of health services in the national picture.

Foundation officials' reactions were that great care is needed in selecting a health insurance plan, as many offer promotional sales plans rather than true medical plans; that medical opposition to health and hospital insurance stems partly from loss of public confidence and prestige and partly from fear of anti-trust suits; and that no one is squarely meeting the changes occurring in medicine.

Future Industrial Health Programs

IDEAS concerning the proper scope and emphasis of future industrial medical programs showed great variety of thinking. The attitude that future expansion should be kept within narrow limits found favor generally among business executives and doctors in industry, as well as among some health department officials. The consensus of industrial opinion was that industrial medical programs should be limited to health care within the plant and during working shifts, with particular attention to occupational diseases, emergency care, and reasonable preventive treatment.

Health department officials questioned how much further industry and labor could go without sacrificing more than they gain, indicating a feeling that health insurance programs must be voluntary.

Unions desire wider coverage and better organization. They believe that future programs should include nursing and first aid; individual guidance and protection through the medical staff; family coverage and preventive medicine; coordination of home, factory, office and community health services; extension of health insurance to cover medical bills both at home and at work, etc. As an ultimate goal, comprehensive coverage is visualized under prepayment plans to include dental and eye care, drugs and institutional service, home nursing, plus medical and surgical benefits. At the Los Angeles Conference, union majority opinion favored group medical practice as combining quality service with economy.

Deans of medical schools expressed varying ideas. One point of view holds that emphasis will shift from the patient on his back to the one on his feet; from the patient in the hospital to the individual in his home and community. Comprehensive and cooperative plans were favored by some respondents in this category, although there was some pessimism regarding costs. Feeling was also expressed that the future pattern would evolve without over-all planning, but rather through experimentation.

Heads of medical societies urged that the importance of the personal physician be stressed in future plans.

Who Should Take the Lead in Industrial Medicine?

THIS provoked heated and divergent opinion. Very decided attitudes both pro and con were expressed concerning organized medicine's activity in this respect.

Primary leadership by the medical profession is advocated by practically all the heads of medical associations, by the majority of the insurance field representatives, and by some industrialists. Among health department officials there was advocacy of a national committee of medical leaders with the strong participation of public health physicians to advise labor and industry. Opinion was expressed by some advocates of medical leadership that only through such leadership could the profession "keep control of industrial medical practice. Even among such advocates, feeling was evident that organized medicine might be too conservative to encourage necessary experimentation. The need for and lack of administrative experts within the medical profession were also cited.

There was support for joint medical leadership with other groups. This was the opinion of some deans, and of a minority of the spokesmen for all other groups. Among those having this point of view, there was mention of community councils with a medical advisory committee. Other ideas for joint leadership with medicine included cooperation of local organizations, physicians, industrial medical specialists, and representatives of management and labor; also a commission of highly experienced physicians, employers, and *possibly* labor representatives.

Among other responding groups there was frequent mention of the leadership role medicine *ought* to play, but which it was felt it did not assume, or did inadequately. This point of view came from unions, from insurance field respondents, from consultant engineers, and from industrialists, and it also appeared in replies from medical editors. As a union official expressed it, "The medical profession SHOULD (assume leadership) but WILL NOT do it." Insurance field respondents felt that organized medicine was not supporting Blue Cross and Blue Shield plans, and stated that the doctor's stature has decreased considerably in the past 20 years. A consultant engineer termed organized medicine "hog tied" and not representative of the rank and file. In addition to accusations of non-leadership, the medical profession was blamed by unions for the present high cost of medical care, due, it was felt, to such things as duplication of offices and facilities. In union correspondence the point of view was expressed that the way to prevent socialized medicine was for the profession to cooperate with unions on lower rates for a total group.

Pertinent to all these critical appraisals was the warning from a medical society head that "It would be extremely foolhardy if the medical profession were to close its ears to labor's request for cooperation, large or small. . . . If we muff our chance now, the blame must reside with us."

Management leadership or joint management-labor leadership had its advocates. Some business comment was that management should determine the extent of the services, and management and labor together should decide on the type of service. Some doctors in the industrial field, however, expressed concern over management's lack of interest. The role of the personnel division in determining policies and health programs was stressed. Among unions, comment was that leadership and administration should be the joint responsibility of all concerned, with labor and management most frequently mentioned as desirable leaders. Among insurance field respondents there were advocates of joint labor-management leadership. Management leadership was advocated by the majority of consultant engineering opinion.

There was definite opposition to government leadership, particularly coming from the consultant engineering group, the industrial group, the insurance group, and, of course, the medical society group and the deans of medical schools and editors of medical journals. Government leadership was generally opposed with the exception of the labor group which almost unanimously asked for government leadership. Among health department officials there was mention of possible leadership through cooperation of medical organizations with Federal and larger state organizations.

Who Will Pay the Cost?

I NOW COME to the main question: Who will pay for industrial health care as the field widens and develops? With the exception of the labor group, preponderant opinion was that the costs of any plans for health care should be borne jointly by the individual and industry. Along this line some business executives advocated voluntary programs sponsored by private insurance carriers and supported by employer-employee contributions. Majority opinion among insurance leaders, directors of foundations, heads of medical societies, deans of medical schools, editors of medical journals, and health department officials all supported management-individual cost sharing. The majority of these leaders felt that the individual must be responsible for a part of the costs.

According to union opinion, however, industry should pay these costs, but there is an expressed willingness to compromise, at least for a time, by settling for aid to medical education, larger appropriations for medical research, construction of hospitals and other facilities, and grants to medical care plans which, in the absence of comprehensive coverage and where pay is low, serve to tide over the worker.

Two labor leaders advocated that industry and labor should share the costs in the event that total comprehensive insurance does not become readily available to labor. Ultimate aim is expressed by all as being a Federal law to cover hospitalization and doctor bills paid for through employer-employee contributions to general tax revenue.

However, in various conversations with industrial, insurance, and labor leaders, there was

strong indication that what labor really wants to achieve for its workers is medical programs, including catastrophic illness, paid entirely by industry, rather than government subsidized medical plans which would impose a payroll deduction on the worker.

The degree to which the individual should pay the costs is the subject of varying belief. Some business opinion holds that, while industry should pay for occupational illness, industrial hygiene and preventive medicine, the individual should pay for therapeutic care. Heads of medical societies felt that it was industry's responsibility to provide some kind of in-plant care station, safety and preventive medicine within the plant, emergency treatment, and transportation of the sick to hospital or to home. The minority point of view in the insurance field was that the individual's health is his own responsibility, and that industry's only concern is for safe and healthy working conditions, and pre-employment health examinations to determine fitness for employment. However, it was conceded by the same minority that insurance might be borne jointly by employer and employee if the individual chose to look after his health in that way.

The proper role of government in paying costs was the subject of comment. Some industry opinion felt that industry, labor, and government together will share costs. Among some health department executives there was advocacy that costs be borne by a combination of private and government funds, mention being made of President Eisenhower's scheme for reinsurance of private pre-payment plans, Federal insurance of mortgages on health facilities, etc. Heads of medical societies and the majority of industrial leaders, on the other hand, were generally opposed to government aid, feeling that government intervention and free medical care are undesirable, leading to abuses, and interfering with the concept of private enterprise. Some within the insurance field felt strongly that the government should not become involved beyond care of the indigent and unemployed.

Among miscellaneous opinions was the belief that the system of payment should be whichever one survives best as a result of free experiment.

Considerable opinion in most categories held that, no matter what the theory, in the final analysis the public will pay.

Summary

SUCH are the highlights of fact and opinion disclosed by the survey. Summing up, what do they show? There are three principal protagonists—management, medicine, and labor. On a few points they agree: namely, the importance of industrial health care, the desirability of basing retirement on physiological factors rather than arbitrary age, and the importance of personalized care. Beyond these issues there are conflict, dissent, and frequently open opposition to each other's points of view.

For example, management and labor emphasize the importance of preventive medicine; medical opinion, on the contrary, is mostly lukewarm or cold to its value in the industrial health picture.

Viewing the role of the industrial health specialist, the three protagonists, although not violently opposed, emphasize different aspects. Management stresses his administrative and varied liaison duties. Labor assigns to him the guidance of labor and management toward proper health programs and insurance programs. Medical opinion emphasizes his purely medical functions, and tends to view him in the role of instituting and safeguarding safety programs and proper sanitary conditions.

Viewing present programs, management is satisfied; labor is extremely critical; medical opinion is generally silent on the point.

Tremendous differences mark the attitudes toward proper scope of future programs. Industry wants expansion held within narrow limits. Unions seek almost unlimited expansion. Medical opinion is mixed, but tends to view expanded medical programs with foreboding, and is particularly concerned with maintaining the status of the individual physician in any future pattern.

As to health care education, industry looks upon it primarily as a function of management; labor views it as a joint program to be carried out by labor and management; medicine, in general, emphasizes its own role in this field.

Future leadership is a storm center of violent and acrimonious opinion. The only generally common ground is that leadership should *not* lie with government. That it should logically come from the medical profession is noted by both management and labor, but from both quarters there is strong and often harsh criticism of medical attitude to date, coupled with the discouraged assumption that little can be hoped from this group in the future. Even within the profession itself, where medical leadership naturally has its strongest advocacy, there is much criticism of organized medical attitudes, and pessimism as to the development of acceptable leadership attitudes. Management and joint management-labor leadership are the alternatives most generally approved, the former by industrial opinion, the latter by labor.

Finally as to where the costs should rest, industry in general feels it should be a joint sharing of business and labor; labor wants industry to pay, though evincing a willingness to compromise for the present; considerable medical opinion supports the joint business-labor sharing idea. Medical and business opinion also hold the belief that the individual should bear a certain part of the costs—a view to which labor gives no support. Government cost sharing is advocated by a portion of industry but is strongly opposed by most medical opinion.

The Future

SO MUCH for summation of the present situation and of present thinking! Where do we go from here? It seems to me crystal clear that continuance of the present internecine struggle will be fatal to the welfare of the American worker in

whose name the battle is being waged. The struggle for power in this field is pushing aside a sober search for solutions beneficial to all.

The nature of the present struggle precludes any hope that "natural evolution" will of itself bring about sound and beneficial policies and practices for the days ahead. Enlightened *action* is necessary to meet and anticipate the change, not merely to catch up with it, because a stalemate in the present struggle, or the winning of it by selfish interests, would be a national tragedy.

Since many are convinced that the individual costs of adequate medical care are high, and a recent survey by the National Opinion Research Center of the University of Chicago showed that 61% of those interviewed felt that the costs of medical care were too high, or somewhat high, it is evident that whatever solutions are applied to this problem, a sound industrial medical program has an important role to play.

Industrial, medical and labor leaders must therefore consider and seek agreement on such matters as these:

1. What is the best method of providing generalized, comprehensive insurance for the American worker and his family that is at once efficient, practical, and consonant with American democratic beliefs?

2. What will be the most just and constructive manner of apportioning health care costs in years to come?

3. How shall we demonstrate to labor that medical plans can be designed to cover the needs of the American working public without recourse to government?

4. How can we foster and protect American medical practice and its future development in a manner to satisfy labor, industry, and the American public, all three?

5. How shall we convince management of the inadequacy of most present industrial medical services, and of the desirability of more complete diagnostic and referral services?

Accomplishment of these latter objectives will obviously be dependent on the utmost continuing efforts of liberal leadership in all three camps.

6. What is preventive medicine in industry? What should be its basic standards?

7. How establish status for the industrial Medical Director in his role of health officer to the industrial community?

Many other appropriate subjects for discussion will immediately suggest themselves. Only a few points of departure have been indicated.

But whatever the agenda, the result should be to provide the American people with informed leadership opinion whereby they can be guided in making those ultimate decisions which are—or should be—in their hands alone.

Our national government currently has in process further consideration of methods and programs for promoting adequate and comprehensive medical care. I suggest that intensified study by the medical profession and by industry and labor of the role of industrial medicine in connection with such programs, is an urgent and immediate need.

In closing may I revert for a moment to the subject of re-orienting present-day official medical thinking, which my survey shows to be frequently out of step with leadership opinion in other fields, and which is also the subject of grave misgivings within the profession itself. It is my earnest belief that all of us must take positive steps to convert it from negative to positive attitudes towards the objectives now sought by the great majority of Americans. No more than King Canute can we hold back the tide, nor should we want to. If we take thought we can direct and channel existing desires into constructive channels and reap the rewards of forward-looking leadership. But we cannot block twentieth-century demands for more adequate health care by invocations to nineteenth-century concepts. Our profession, which is so adventurous in seeking new healing aids, should be equally adventurous in seeking new ways to bring the benefits of those findings to the men and women of America.

The Leveller

AN EDITORIAL in the *New Jersey Medical Journal* a few months ago, entitled "Illness the Leveller," is quoted as follows: "The president of the company and his janitor are on the same plane when each lies on his belly, his buttocks in the air, awaiting the proctoscope. When a woman is swallowing a stomach tube or receiving a colposcope, then, truly, Judy O'Grady and the Colonel's lady are sisters under the skin. Illness is a leveller not only because—with their pants down—all men are equal, but also because fear wipes out arrogance and crumbles dignity. Faced with fear of pain, fear of death, fear of disability, all men react according to their temperament and not according to social caste or income tax. So it is—or it should be—that physicians make the best apostles of democracy and the poorest supporters of a 'master race' thesis or a 'class dictatorship.' For, as every physician knows, there are no commissioned officers in the ranks of the frightened, the pained, the crippled, or even in the ranks of the undressed. In that army we are, indeed, all brethren and sistern."

—From an Editorial in *Rocky Mountain Medical Journal*, January, 1956.

The Aging, Ailing Truck Driver

With Special Reference to the Motor Carrier Safety Regulations of the Interstate Commerce Commission

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WITHOUT exception, we are all subject to the process of aging. It might be said that we begin to grow old from the day we are born, but actually the pattern is a little different and we do not all age at the same rate.

On the average, man reaches his physical maturity at age 18 to 21, but he does not reach intellectual maturity until much later in life—in his forties or fifties. And that's at the time when the degenerative diseases begin to show up. There is the irony of fate. No sooner does a man reach his intellectual maturity, when he can make the most of his strength, experience and wisdom, than he begins to fall apart.

The prevention of illnesses and accidental injuries and their related losses is an innermost desire of each of us. Alert management is giving an increasing amount of thought and effort towards proper job placement and health maintenance of its employees. Today, health is big business and good business; a healthy, accident-free work force is essential to the successful operation of any company.

Recent ICC Regulations

GREATER safety on the highway will require more education, more enforcement, and more engineering. As one means of promoting safety on the highway, the regulations of the Interstate Commerce Commission now require:

1. That drivers engaged in interstate commerce must meet certain minimum physical standards.
2. That such drivers must be re-examined at least once in every 36 months.
3. That such drivers must have in their possession while driving, a certificate, duly signed, from a licensed doctor of medicine stating to the effect that the driver concerned is physically qualified to drive.
4. That copies of such doctor's certificate shall be filed with the employer and in the medical examiner's office.
5. That a completed physical examination record for each person examined and certified be kept by the medical examiner in his office.

There is nothing in the law to prevent the employer from requiring more stringent physical qualifications or more frequent examinations than are specified in the ICC regulations but anything less would be in violation of the regulations.

Distribution of Drivers According to Age

AMONG oil companies that have been in business for a relatively long time, the average age of the truck driver is about 39 or 40. In the various age brackets the 30 to 40 group contains the largest number of drivers, with a gradual decrease in the number of drivers in the older brackets until age 60 is reached, when a sharp decline occurs. This decline in the number of truck drivers in the 60 to 65 age bracket is approximately 50% greater than the decline in the same age bracket in other types of occupations. While some older drivers are otherwise assigned or request job transfers, it is apparent that health and safety factors in the light of job requirements are the chief reasons for this difference in decline. Strict application of ICC health standards will further thin the ranks among truck drivers in the upper age brackets thus creating more placement problems than we have had in the past.

ICC Minimum Physical Requirements

THE WORDING of the minimum physical requirements of the Interstate Commerce Commission leaves it up to the judgment of the medical examiner to a considerable extent as to whether the individual is physically qualified to drive. On certain points, however, the requirements are specific, and since these regulations have the effect of law, there is no leeway for argument or difference of opinion on the part of the medical examiner. The minimum requirements are as follows:

1. "No loss of foot, leg, hand, or arm."
2. "No mental, nervous, organic, or functional disease, likely to interfere with safe driving."
3. "No loss of fingers, impairment of use of foot, leg, fingers, hand, or arm, or other structural defect or limitation, likely to interfere with safe driving."
4. "Eyesight: Visual acuity of at least 20/40 (Snellen) in each eye either without glasses or by correction with glasses; form field of vision in the horizontal meridian shall not be less than

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a total of 140°; ability to distinguish colors red, green, and yellow; drivers requiring correction by glasses shall wear properly prescribed glasses at all times when driving."

5. "Hearing: Hearing shall not be less than 10/20 in the better ear, for conversational tones, without a hearing aid."

6. "Liquor, narcotics and drugs: Shall not be addicted to the use of narcotics or habit-forming drugs, or the excessive use of alcoholic beverages or liquors."

Not All Physicians Familiar with ICC Requirements

A STUDY of this situation has revealed that some medical examiners are not entirely familiar with the requirements or the full intent of the ICC regulations. This is quite understandable, since the revised regulations were effective as late as July 1, 1952, with certain features effective January 1, 1954.

The responsibility for certifying after examination that an individual is physically qualified to drive, under the ICC rules, falls squarely on the shoulders of the medical examiner and it should not be taken lightly. The employer shouldered with all the responsibilities and liabilities applicable to a "Carrier" must rely on the thoroughness and judgment of the physician as to the employability or continued employability of the driver. Finally, the public has a valid interest in this whole matter. Therefore, it is recommended that physicians wishing to make these examinations become thoroughly familiar with what is required of them under the ICC regulations.

Emotional versus Physical Requirements

WITH the addition of modern improvements on trucks, such as power steering, power brakes, and power lifts, the demand for muscular exertion on the part of the driver or operator is diminishing. In this respect the job of the aging driver is becoming easier and more compatible with his physical condition. However, the marked increase in traffic, particularly in urban centers, has increased the element of stress not only for truck drivers but for all drivers of motor vehicles. Fortunately, most truck operators adjust themselves to the stress of congested traffic through experience. Those who can't take it eventually find other jobs through transfer or otherwise.

Emotional stability is as important for safe driving as is general physical qualification. This is well illustrated by youthful drivers who are physically sound but emotionally immature; as an age group they have the most accidents. Drivers who are emotionally stable are least susceptible to outside stimuli. The outside stimulus—whether it be a scrap with the wife, or the boss, or anger at a motorist who "cut in"—leads to mental distraction, the underlying cause of many accidents ascribed to human failure. In a limited study, Dr. Harold Brandaleone, of New York, found that bus drivers selected through the aid of tests which included psychological tests designed to screen out the emotionally unstable, had fewer accidents than those who did not take such tests.[1]

Emotion in good balance is essential to all of us. It gives us the spark to carry on. While the older truck driver may be considered to be emotionally mature, he may still have temporary emotional upsets that make him accident-prone. Repeated or protracted emotional upsets may have a complex background, but, rather than wait for accidents, the situation calls for prompt evaluation and handling by the physician and by management.

Ailments of Special Concern

IT IS NOT possible in the time at hand to discuss the many diseases and combinations thereof which may afflict the aging individual and create problems of employee placement or other handling. A few of such ailments, however, seem appropriate for comment:

1. *Epilepsy*—Epilepsy may be sufficiently controlled by the use of drugs to permit persons having this ailment to pursue certain gainful occupations. However, epileptic attacks may occur in spite of treatment. Therefore, epileptics would be ruled out as drivers under the ICC regulations.

2. *Obesity and High Blood Pressure*—It is often said that one can be sure of good food at a roadside diner if trucks are parked outside. Whether obesity among truck drivers is due to overindulgence in food, a somewhat sedentary type of occupation, or the attempt of employers to hire heavyweights to begin with, is not clear. A combination of circumstances apparently prevails inasmuch as the incidence of obesity among truck drivers seems to be higher than among other groups of outdoor workers. A striking observation is the increase in blood pressure along with obesity—a combination which if unchecked frequently leads to premature disability. Unless the condition is one of essential or malignant hypertension, weight reduction is usually accompanied by a decrease in blood pressure. It is also commonly observed that obesity and diabetes go hand-in-hand. Hence management could help its employees and itself in a rather simple and effective manner by actively frowning on obesity. Should a driver be found to have a blood pressure of critically high levels it would seem advisable to "ground" him temporarily in order to permit time for medical evaluation and future handling. Simple hypertension in itself may not be sufficient reason for disqualifying a driver unless accompanied by other complicating situations. Extreme pressures would, of course, be disqualifying but, in any event, each case must be judged on its own merits.

3. *Diabetes*—When diabetes is first detected in a truck driver he should be grounded while his physical condition is being evaluated and he learns how to control his diabetes. In the absence of other disabling diseases it would seem reasonably safe to permit such a person to return to his job providing he is kept under medical supervision, he is cooperative in carrying out appropriate treatment and his diabetes is adequately controlled by dietary measures. He should not

be returned to his job if the aforementioned factors cannot be achieved. Obviously, each case must be individualized and handled on its own merits. If insulin is used by a diabetic truck driver or if such use is indicated, he should be grounded permanently. At first thought it would seem desirable for the physician also to individualize each case of this type. This, however, is not advisable inasmuch as the physician, the diabetic, or the employer does not always have control of conditions which would safeguard the diabetic driver against either diabetic drowsiness or coma, or insulin shock. Long hours, irregular meals, emergencies or breakdowns, wherein food or insulin may not be available, are some of the complicating factors beyond control of the certifying physician. Hence, company policy on this type of case should be the governing factor. This recommendation does not hold entirely for drivers of passenger vehicles, who use insulin, since their job risk is not so great and they can observe more regular hours of meals and work. A urinalysis should be included in all examinations regardless of blood-pressure findings lest diabetes go too long undetected. Too often medical examiners omit the urinalysis in view of the ICC regulations which read in part as follows: "Urine analysis is indicated wherever the systolic blood pressure is over 150 and diastolic over 100."

4. *Coronary Occlusion*—The disposition of a driver who has had a coronary occlusion confronts the employer with a serious problem, particularly if the employee is a tank truck operator. Should he be permitted to resume operating a tank truck? If not, what should be done with him? Truck operators are usually outdoor people. They are not trained for desk jobs and furthermore there are very few gates to watch around a sales department, or many other oil operations.

A few, but comparatively few, tank truck operators have been permitted to resume their jobs after a known coronary occlusion, providing they made a good recovery and the rest of their medical picture was favorable. However, the occurrence of the next occlusion cannot be predicted, so in actual practice most of the known cases of coronary occlusion with infarction have been permanently grounded insofar as driving a tank truck is concerned. Management may wish to establish a definite policy in view of the slight differences of opinion among physicians on this point. The US Air Force and commercial or passenger airlines, for instance, ground permanently all of their pilots who have had known coronary occlusions.

However, in fairness to all concerned, and to permit the spark of hope to remain alive, it would seem best to judge and handle each case on its own merits.

Admittedly, a recommendation for individual appraisal and handling of heart cases sounds good but a second look at the risk involved in the employment of cardiacs is justified in the light of some recent compensation commission or court rulings on the compensability of death or disability from coronary occlusion occurring while at work. The Illinois Supreme Court,[2] for instance, in affirming the award to a worker who sustained a coronary occlusion while at work shoveling coal into the furnace of a steel mill, has ruled to the effect that:

(a) A coronary occlusion can be considered an accidental injury arising out of and in the course of employment,

(b) and—"there need be no external violence to the body to constitute an accidental injury, and compensation may be allowed where a workman's existing physical structure, whatever it may be, gives way under the stress of his usual labor,"

(c) and—"there need be no showing of unusual strain or activity beyond the habitual requirements in such cases in order to establish an accidental injury."

Although the Illinois decision may be the beginning of a trend in this regard, I do not believe that the trend is sound, and business should be fully informed and alert as to the possible consequences.

When one considers that coronary occlusion is in reality the end result of a degenerative disease process in the coronary arteries which has been years in the making, one cannot help but feel that the coronary occlusion occurring at work is a coincidence during work rather than a result of work. More occlusions occur away from work and while asleep in bed, for instance, than occur on the job. Nevertheless, court decisions are realities with which an employer must live. While the Illinois decision with respect to coronary occlusion might simplify workmen's compensation administration, it complicates the accidental injury and job placement problem for the employer and it automatically reduces the opportunity for the "cardiac" to obtain employment in industry.

Ohio, on the other hand, has recently taken a constructive step by enacting a code which provides, in effect, that if any handicapped employee, presently employed or hired hereafter, comes within the definition of handicapped employee as defined in the code, and if such employee is subsequently injured, the employer may be entitled to have all or a portion of the claims cost charged to a Surplus Fund.

What Can Be Done?

THERE is no fast or simple solution of the problem of the aging, ailing truck driver. Since the problem will continue to grow it would seem advisable for employers to adopt a policy of preventive maintenance for all drivers.

Some measures which can be helpful are as follows:

1. Select physically and temperamentally qualified applicants at the outset.

2. Select applicants who have at least a high school education.

3. Give periodic physical examinations to all drivers and appropriate medical supervision and follow-up.

4. Give truck drivers some training in other jobs such as office, loading and warehouse work

so as to simplify the placement problem if and when the driver is no longer able to drive a truck. Conversely, some physically qualified warehouse or other employees might be trained in truck driving in order to provide a reserve of drivers and to facilitate job switching. Any problems of pay differentials and seniority would obviously be a matter for handling by the individual employer.

5. Study operations, job structures and requirements to see if new and productive job opportunities can be created for the grounded truck driver who is still employable. The handling of a permanent partially-disabled truck driver, for whom no job exists or can be created, is a matter for the individual employer, but admittedly that is where the shoes pinches.

6. Retire drivers who are permanently and totally disabled or who are disabled to such a degree that employment of any kind would be hazardous.

Summary

1. TRUCK DRIVERS, who as a group have earned and deserve the reputation of being the most courteous drivers on the road, are subject to the same general ailments that affect other employees —but job placement of aging, ailing truck drivers is a greater problem because of safety requirements in connection with their job.

2. Physicians who examine drivers subject to ICC regulations should become thoroughly familiar with such regulations in order to discharge their full responsibility.

3. Employers and employees would benefit by management coordinating insofar as possible the ICC program for physical examinations of drivers with its own preventive health program for employees.

4. In fairness to all concerned, and in keeping with present efforts to employ the physically handicapped, the disabilities resulting from the non-occupational degenerative diseases which afflict the aging worker should not be charged to employers by the various compensation commissions.

(135 East 42nd Street.)

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3. Interstate Commerce Commission: Motor Carrier Safety Regulations, Revision of 1952.

How to Read an Editorial

IN READING an editorial, the first requisite is to *read* it. One reads first for the purpose of acquiring a general idea of the subject covered. At this point one's gorge does not rise; one's hopes and fears are not read into the piece. If the topic is of no interest, the matter ends and one is in no position to comment or criticize. A second reading is important. Now the points are considered in relation to each other—the gorge may be permitted to rise or a soul-feeling approbation to suffuse the consciousness. Editorials are written by people who are willing to express a point of view and to defend it. They may consist of tranquil thoughts, philosophic peregrinations, attempts at prophecy, satirical, even sneering, thrusts, unilateral or bilateral comments on proposed actions. Opinions so expressed or evidence so presented will be mild, moderate, or violent; but they are carefully and thoughtfully written and rewritten with utmost attention to the semantic subtleties which will best convey the intended meaning. An editorial is usually meant to be provocative. Whether the reader's reaction is benign agreement or violent disagreement, reader attention is invited, as is comment—in writing. Put your thoughts in writing. You will find them more enlightening than coatroom conversation. Editorials have been confused with official W.C.M.S. policy. This is already disclaimed sufficiently on the masthead of the *Medical News;* but the Council recently received a request to carry a running footnote of the same nature on the Editorial Page. The proposal was not adopted; nevertheless, our last two editorials have carried the subtitle "One Man's Opinion" as an introduction. We believe that additional pointers are unnecessary. Editorials reflect personal opinion, are subjected to careful scrutiny by the Editorial Board, and are not intended to tell you how to think. They invite thought.

—MAX L. LICHTER, Editor's Page, in *Detroit Medical News*, December 12, 1955.

Extensor Tendons in the Industrially Injured Hand

—SURGICAL METHODS FOR PRIMARY REPAIR

CARL E. NEMETHI, M.D., Los Angeles

WOUNDS to the dorsum of the hand and fingers account for a major proportion of injuries seen in the practice of industrial medicine and surgery. These innocuous accidents, like the common cold, are regarded lightly but are responsible for massive amounts of permanent partial disabilities and time loss from the job.

The "Achilles heel" anatomy of the extensor tendon mechanism predisposes tendon injury following even the slightest trauma to the dorsal skin. Too many such minor injuries are treated as a "first aid" by the plant nurse or first aid man. Only after obvious deformities appear and tendon excursion becomes painful and/or limited is the plant physician consulted (Fig. 1). Fresh tendon injuries present trying problems but deferred patients offer a challenge defying conventional approaches and are predestined to malfunction. Flatt states that Rank and Wakefield rightly stressed the difficulties frequently met in trying to obtain a result which is of a high standard both from the surgical and practical viewpoints.[1]

The author's operative experience with a group of 500 such patients clearly demonstrated that crippling sequelae were dramatically reduced by immediate plant referral of the injured to the industrial physician qualified in tendon surgery. Prompt, proper operative intervention is recommended. Ideally, a one-attempt, primary repair should be the goal; for the anatomy of the extensor mechanism defies repair and revels in the production of binding and crippling scar tissue. Probably in no phase of hand surgery is the operator confronted by such frustrating "what-to-do" decisions. Conventional and standardized approaches cannot cope with the problem since each injury is a many-faceted entity in itself and must be so treated. The operator should be skilled in hand surgery but above all must have imagination and unlimited ability to improvise.

Injuries and their sites can parlay to multiple equations and complexities but for simplification, Flatt, in his discussion of minor hand injuries, describes four common sites of extensor tendom trauma: the dorsum of the wrist, over the metacarpo-phalangeal joint, over the proximal interphalangeal joint, and at the distal insertion of the tendon. These sites were substantiated in the author's series, however, it was further determined that vectors were important because of their direct relationship to specific tendon trauma. Sharp objects caused the greatest number of extensor injuries followed at some distance by fractures, blunt or sharp contusing forces, abrasive action, traumatic ruptures, avulsions and burns.

Almost every "superficial adhesive bridge" laceration dorsal to the tendon resulted in nicking or buttonholing of its fibers. Deep cuts

Fig. 1.

Photograph of the end result after an "adhesive bridge" laceration was treated as such. Four weeks after injury the patient presented a large nodular area, extremely painful and almost malignant in appearance. Motion of the middle finger was severely restricted. The injury became so painful and crippling consultation was demanded. After excision of the tumor mass the underlying tendon demonstrated an unhealed, roughened laceration surrounded by dense scar tissue containing numerous foreign bodies. Tendolysis and meticulous debridement were carried out. An elliptical excision of the unhealed laceration removed the remaining pathology and permitted free tendon gliding. The patient was placed on Combiotic, 2 cc. daily for five days, and healing per primam took place in three weeks. Skin sutures were removed and active motion started. Full asymptomatic motion was present eight weeks postoperatively.

1. ADRIAN E. FLATT: "Minor Hand Injuries." London, England: *The Journal of Bone and Joint Surgery*, 37B: 1, (February) 1955.

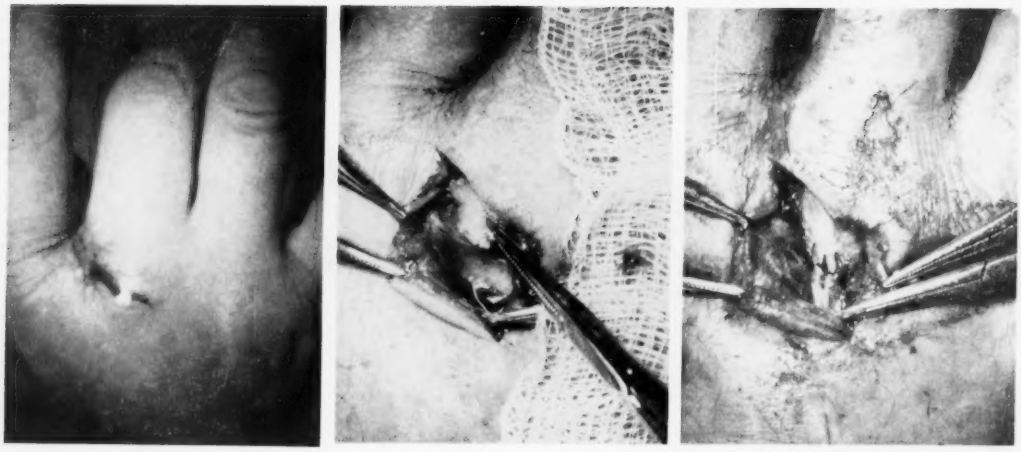

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Fig. 2.

A—Photograph taken immediately after trauma by a sharp instrument. An apparent superficial laceration is demonstrated in the region of the metacarpophalangeal joint of the middle finger. However, its seriousness is apparent in the dramatic finger drop. B—After minimal surgical extension of the wound its major nature is apparent. The proximal segment of the severed common extensor tendon has retracted almost three-fourths of an inch. The distal portion is demonstrated by the tip of the large hemostat. Capsular structures were not involved. C—Anatomical end-to-end approximation has been achieved by interrupted 0000 silk sutures. The sutured tendon can be seen lying on its slippery bed. Adequate gliding material is visible on either side and when closed will insure smooth motion dorsally. Recovery was uneventful. Full range of motion was demonstrated six weeks postoperatively.

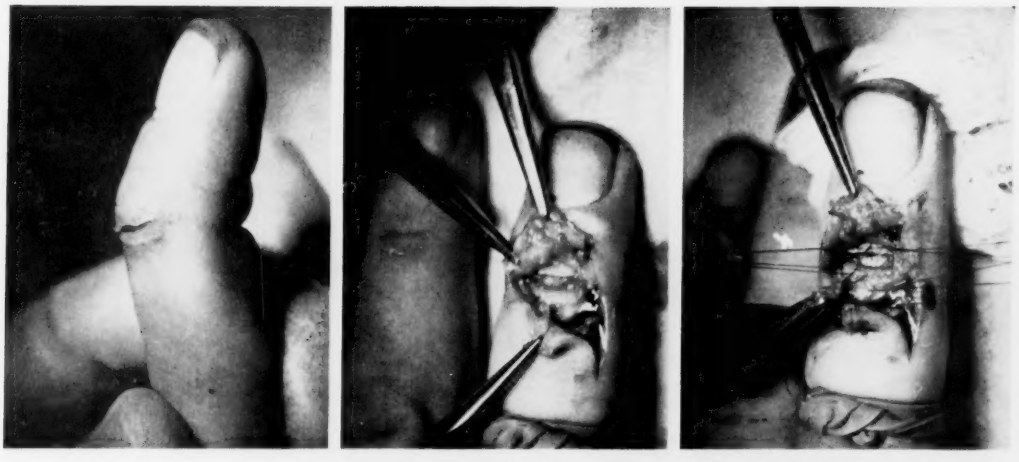
proximal to, or the metacarpophalangeal joint, generally severed the tendon (Fig. 2); or, if over the proximal phalanx, the central slip (Fig. 3). The lateral slip became involved if the cut was on the middle phalanx, and the dorsal fibers, if over the distal phalanx (Fig. 4). Multiple combinations of these injuries were not uncommon. Fractures of the underlying bony phalanges or metacarpals, whether simple or open, invariably produced tendon damage ranging from simple contusions to extensive lacerations (Fig. 5).

Much of the partial permanent disability following fractures can be attributed to tendon damage. Contusions wherein the tendon is crushed between the skin, the vector force, and the underlying bone account for a far greater number of disabilities than is commonly thought. Such forces can cause immediate severance of tendon fibers or, through crushing, produce a "spontaneous" rupture days or weeks later. Adhesions are usually massive and extensive. Abrasive agents such as emery wheels, sanders, etc., inflict fewer injuries than in past years, owing to increased guarding of such machinery. However, they still cause a fair percentage of serious minor-major trauma. Such accidents are characterized by large, extensive, and usually deep soft and bony tissue losses (Fig. 6). The fingers are particularly susceptible to this type of injury.

Not too common, but perhaps presenting some of the most baffling and frustrating entities are the traumatic ruptures of the extensors at or near their points of insertion. We are all acquainted with the baseball or mallet finger and the universally poor results following treatment. The anatomical structure of the tendon in this

Fig. 3.

Photograph immediately after surgical excision of a typical button-hole defect central slip. The "hole" has been excised by the elliptical cut. The central diameter of the ellipse was determined by the diameter of the button-hole. The apices are seen proximally and distally.



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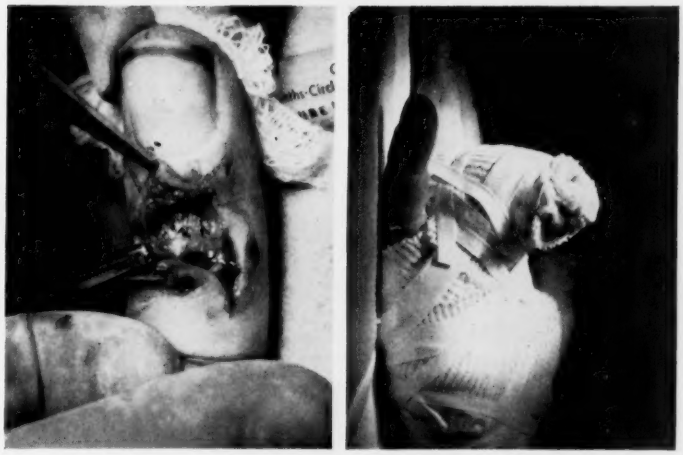

D E

Fig. 4.

A—Photograph taken after what appeared to be a minor laceration of the distal phalanx. The typical mallet or baseball finger is demonstrated. B—The wound has been elongated by a dorsolateral extension. The so-called "minor cut" is now shown to have severed the fibers of the extensor tendon, the fibrocartilagenous plate, and has exposed the joint. C—Interrupted No. 6-0 silk sutures have been placed through the tendon fibers, plate and just dorsal to the capsule and synovial membrane. The white articular surfaces of the joint can be seen deep to the suture line. D—Tying of the sutures anatomically approximates the tendon ends, plate and indirectly the capsule and synovia. Line of closure is almost undectable. Skin and gliding surfaces were closed as previously described. E—Photograph taken immediately after final closure shows stockingette pressure bandage in place. The finger is immobilized with the proximal and middle joints in flexion and the distal hyperextended by a volar plaster splint. Healing was per primam in three weeks. Motion after six weeks was good. However, about a 10° loss of extension was manifest and considered as a permanent partial disability.

area almost guarantees a poor result. Surgical repair of thumb pathology in this area lends itself to superior functional results because of the very slight but definite increased thickness of the transverse tendon sections (Fig. 7). The tissue-paper thinness of the other phalangeal insertions is not so amenable to surgical repair. End-to-end anastomosis of the tendon ends with 6-0 silk interrupted sutures has yielded the best results in this series of cases. It was demonstrated that while the technical procedure of surgery was difficult, the most vulnerable phase of the entire treatment was inadequate means of splinting.

All methods described in past and recent articles were utilized and none found to be adequate. Studies are now under way to develop a simple method of pinning to fix internally the distal joint in extension. If such an approach were perfected it could be expected that the poor results obtained in treatment of these injuries would largely disappear.

Extensive, even minor avulsions, were less frequent. However, when these occurred usually large areas of skin and subcutaneous tissue were lost. The tendon was, as a rule, spared but stripped clean of its dorsal protective structures. When the extensor was included it was not uncommon to see the loss of long sections of fibers (Figs. 5-A and 5-B). Burns particularly due to molten metals, tars and resins concluded the series. First and second degree stages were very common but generally the tendon suffered little. Third degree burns were more rare but produced brutal tendon trauma resulting in severe fibrosis and crippling deformities.

These minor wounds that may become major are predisposed by the vulnerability and super-

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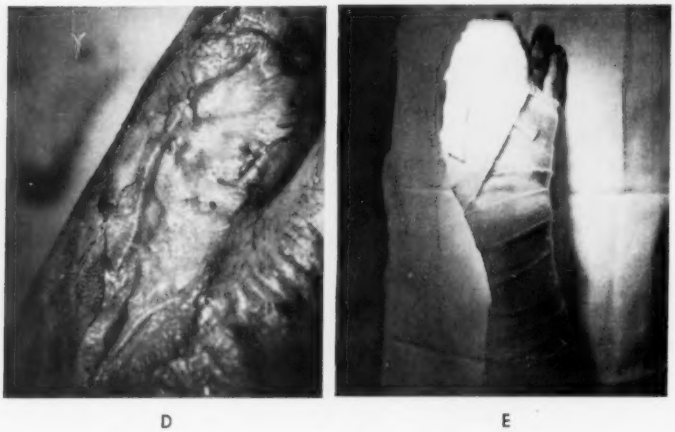

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Fig. 5.

A—Photograph immediately after injury shows an index finger which demonstrated an open fracture, contused and lacerated extensor tendon and a large avulsion of skin and subcutaneous tissues extending from the middle joint to the proximal joint including the entire width, dorsum, of the finger. B—The reduced fracture is visualized in the center of the bony phalanx as a transverse black defect. The longitudinally split tendon is demonstrated by lifting the remaining radial half with a thumb forceps. The contused, raggedly lacerated ulnar one-half of the tendon has been excised from the proximal joint to the middle in a smooth arc. Remnants of the ulnar lateral band were also included. Glistening dorsal gliding membrane can be seen on the radial aspect lateral to the thumb forceps. C—The slippery tissue was dissected laterally and laid between the remaining radial half of the tendon and bone. The remainder was approximated dorsally so as to form a new tunnel. The radial half of tendon can be seen as a white line under the thin membrane. D—The skin defect was remedied by an immediate split skin graft taken from the volar surface of the injured extremity. No sutures were used to fix the graft. E—Furacin gauze strips and pressure dressings splinted by volar plaster immobilize the graft and the finger as well. Progress was uneventful and healing per primam occurred in three weeks. Motion was started and after 12 weeks a functional finger was demonstrated. The finger lacked one-half inch of touching the distal palmar crease but touched the midpalmar groove. Extension was limited about 30°.

ficiality of the extensor mechanism. It is not the purpose of this paper to discuss the detailed anatomy of these very complex and delicately balanced structures but some generalities will be given to aid in understanding the repair problems. Deeply the flat tendons in the hand literally "ride" the metacarpals and bony phalanges. Their only separation is a tissue-paper thin, gliding membrane interposed between bone and tendon fiber. Dorsally, they are protected only by skin and a minimal amount of soft tissue and gliding membrane. In the hand proper the tendons are flattened elliptically and present some cross-section substance, but as they progress distally the cross-section diameter tapers to tissue-paper tenuity at their insertions. Over the proximal and middle phalanges the elliptical section flattens out to a heavy paper thickness and hugs the transverse bony arc. Blood supply is minimal.

Surgical intervention is challenged by this frugal, delicately balanced, vulnerable structure upon gliding structure. Early recognition of tendon injury and simple surgical procedures are to be recommended. All principles of good hand surgery were rigidly adhered to. Stainless steel wire technique was avoided in this series because of its tendency to bunch the tendon. Stainless steel wire was not buried because of inadequate soft tissue protection. Meticulous end-to-end approximation with 6-0 silk on an atraumatic needle was used for repair distal to the metacarpophalangeal joint and 4-0 proximally (Fig. 2-C). Three knots were tied and the suture cut flush to the last knot. It was found that interrupted silk sutures could be laid so that the normal flattened bone-hugging curve of the tendon was preserved;

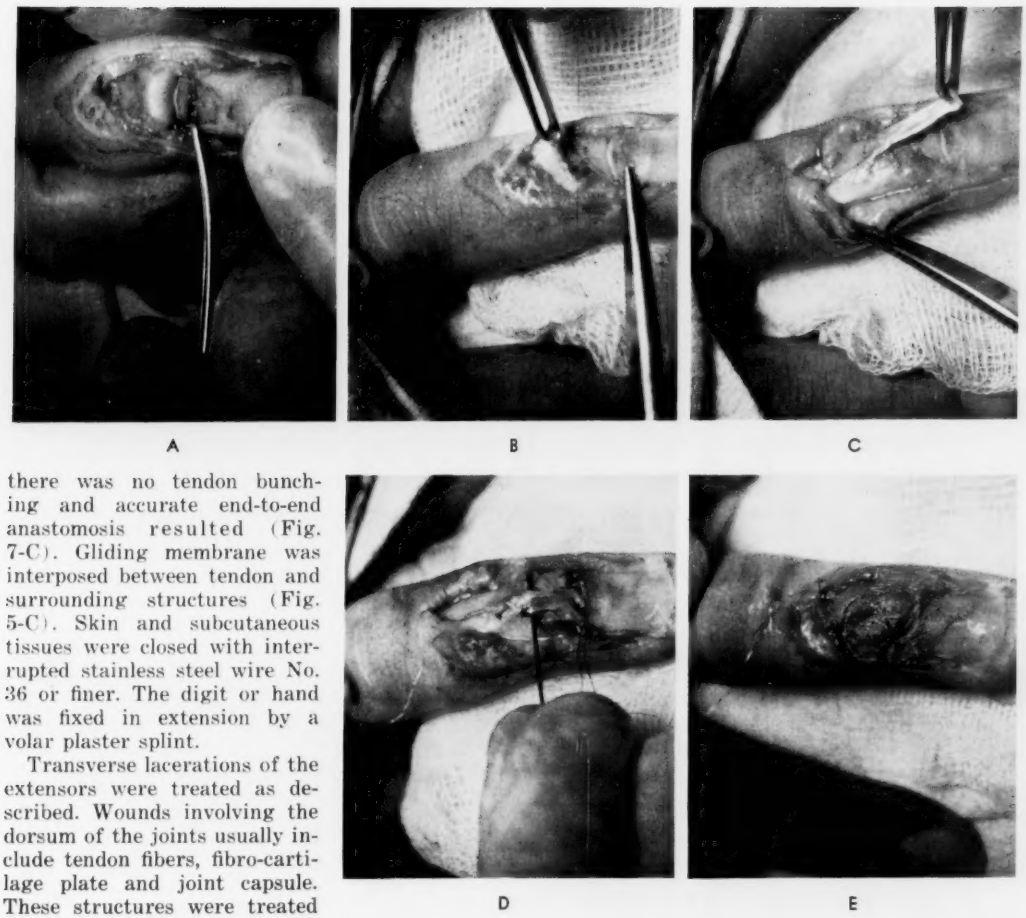

Fig. 6.

A—Photograph of a grinder injury to long finger taken immediately after damage occurred. Tissue destruction is extensive. Soft tissue loss starts at the middle phalanx, beveling distally and exposing the distal joint and the matrix as demonstrated by scissors point. B—Thumb forceps grasp proximal end of flat tendon while hemostat points out a one-eighth inch remaining strip of tendon insertion. An obvious tendon gap of about three-fourths inch is apparent. C—A lateral strip of tendon has been cut transversely proximally, then split distally and folded over at the distal end of the severed tendon to bridge the tendon gap. D—The distal end of the tendon strip has been sutured to the remaining "insertion" fibers so that the suture line lies below the matrix. A thin piece of slippery fascia was taken from the phalanx higher up and placed between the open joint and tendon slip. The four corners were sutured to the adjacent soft tissue. Two tack sutures are in place at the tendon slip fold flattening this area. A probe under the slip demonstrated the flattened tendon "fold" area just proximal. E—An unsutured immediate split skin graft covers the entire raw area. The distal nail bed is visible. Three weeks postoperatively the graft had taken well and healing per primam of tendon had taken place. Active motion was begun. Twelve weeks postoperatively a functional finger was demonstrated. Motion of the distal joint was restricted to about 45° active flexion.

there was no tendon bunching and accurate end-to-end anastomosis resulted (Fig. 7-C). Gliding membrane was interposed between tendon and surrounding structures (Fig. 5-C). Skin and subcutaneous tissues were closed with interrupted stainless steel wire No. 36 or finer. The digit or hand was fixed in extension by a volar plaster splint.

Transverse lacerations of the extensors were treated as described. Wounds involving the dorsum of the joints usually include tendon fibers, fibro-cartilage plate and joint capsule. These structures were treated as an entity and approximated by through-and-through sutures, except the capsule and synovia. Exclusion of them was possible since the sutures were placed dorsal to them. Upon tying the sutures the capsule was indirectly closed and no suture material was left in the joint to act as a foreign body (Figs. 4-C and 4-D). Gap losses of tendon fiber require tendon lengthening procedures as dictated by the pathology present (Fig. 6).

Not all injuries demand suture. First and second degree burns can best be treated by sterile preparation and pressure bandages. Deep second and third degree burns are debrided. All obvious devitalized tissue is carefully excised down to and including damaged tendon fibers. Remaining tendon fibers of even one-fourth inch across are sufficient to afford functional movement. If a sheet of soft tissue covers the tendon, full thickness graft or split skin grafts are in order. One-stage tube abdomino-pedicle grafts are of choice to cover bare tendon and bone. Indicated antibiotic and antitetanic medication is administered.

Certain types of lacerations demonstrated superior function when treated by splinting or ex-

cisional procedures. The common round-type defect found in buttonholing trauma is best treated, not by attempted suture, but by actual excision. The ragged circular-hole defect is converted by fiber removal into an elongated elliptical defect paralleling the long axis of the tendon, the greatest diameter being the button-hole, thence tapering smoothly to points proximally and distally. This approach divides the single expanse of tendon into two mediolateral bands of normal tissue permitting free motion, especially at the critical joint area. Instead of binding on flexion the bands divert slightly laterally and thus avoid the restricted motion of the shortened sutured tendon (Figs. 3 and 8). This maneuver is especially useful in injuries of the middle joint area. When executed properly no boutonniere deformity is produced.

Incomplete severances of lateral slips are treated, not by suture, but again by excision. A long, gradual smooth arc is cut from the tendon slip edge having its deepest point determined by the depth of the laceration. This excises the laceration *in toto* and leaves only a long, smooth curve defect in the slip. If one lateral slip shows a large gap loss of fiber, removal *in toto* of the structure is indicated. Gross irregular fiber losses of the tendon proper are treated by arc excision as described. Functional results by these methods have proved far superior to any attempted suture or grafts. When faced by large gap losses of tendon fiber, tendon lengthening procedures may be tried. Results are fair (Fig. 6).

Following repair, regardless of method, all tendon fiber must be covered by skin if any degree of success is to be expected. The majority of patients are well controlled by split skin grafts (Fig. 5-D), some require pedicle grafts in one stage, others may have sufficient skin to close as is, or flap shifting may be necessary (Fig. 8-C). The wounds are covered by Furacin gauze and fluff dressings. Pressure is applied by stockinette bandaging cut on the bias. Plaster splints immobilize the areas in extension (Figs. 4-E and 5-E). Dressings are not changed for three weeks unless clinically indicated. After three weeks skin sutures are removed and active limited motion begun. The patient receives 2 cc. Combiotic daily for four to five days and longer if indicated. Antitetanic therapy is administered the day of injury.

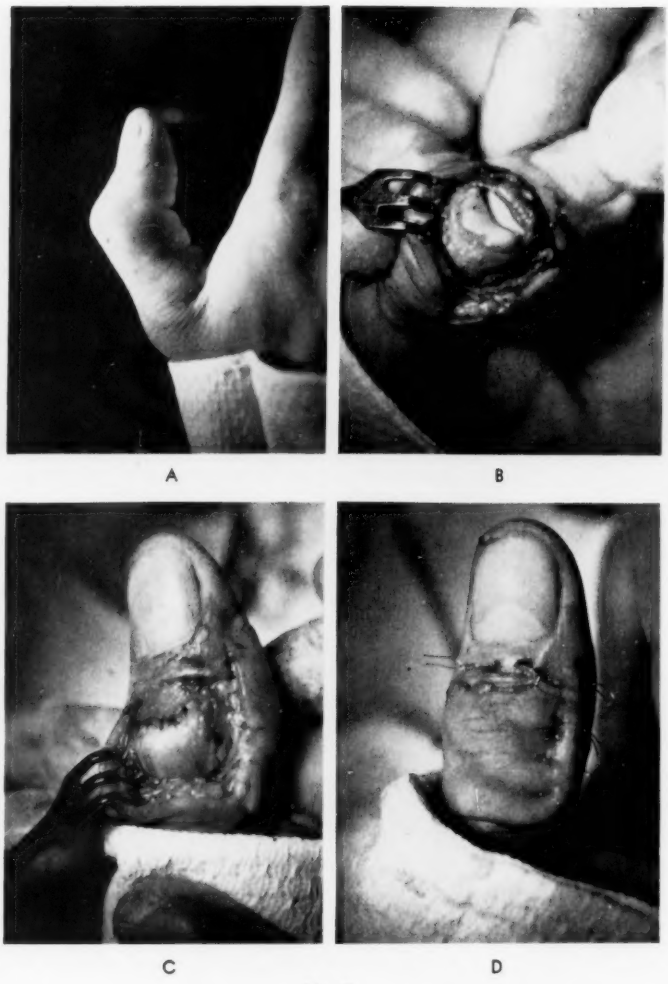

Fig. 7.

A—Photograph of a "mallet" thumb, the distal phalanx of which was "snapped" by a loose pulley belt. No external evidence of injury was apparent except for distal phalangeal "drop." B—Surgical exposure demonstrated the irregularly ruptured paper-thin extensor tendon over the joint proper. The photograph shows the torn and frayed tendon-ends forming a circle about the open joint. It is interesting to note that the major force was directed to the central tendon area. C—Anatomical restoration of the tendon ends was done by 000000 silk sutures placed in the usual manner. The flat transverse arc of the tendon which follows the joint contour has been well preserved. D—Postoperative photograph illustrates type of incisional approach. The wound edges are approximated with stainless steel wire mattress sutures, No. 36 or finer. Since the repair was done under local nerve block the patient was able to demonstrate good flexion and extension before skin closure. The suture line held well. Healing was per primam in 21 days and active motion was then begun. Twelve weeks post-operatively thumb motions were equal.

In conclusion, the alarmingly high percentage of permanent partial disabilities resulting from

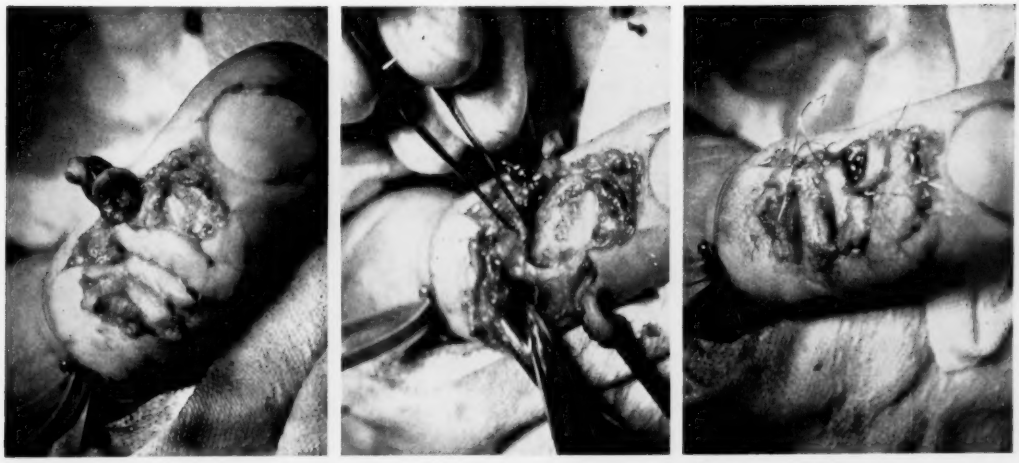

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Fig. 8.

A—Photograph of a right thumb following multiple lacerating and avulsing injuries inflicted by a "cutter." The skin and subcutaneous tissues are shown as being chopped into multiple small flaps. The open joint can be seen as the white area in the distal wound. The distal one-third dorsal surface of the proximal phalanx has been planed off and the central part of the extensor tendon has been avulsed, leaving a tendon defect approximately three-fourths inch by one-half inch. B—After debridement the ragged tendon edges were cleanly excised leaving an elliptical smooth excision. The tendon edges can be seen forming an ellipse about the open joint. C—No tendon suture was attempted. The elliptical excision formed two mediolateral tendon bands which, when actively moved by the patient, did not bind. (Surgery was done under local novocaine block.) Good motion was observed over the joint, the bands shifting slightly laterally on flexion, thus avoiding the usual binding that takes place when the central portion of the tendon is stretched over the flexed joint. Remaining skin flaps were used as full thickness grafts and shifted to cover the defect. Healing took place per primam in three weeks. Active motion was started and a good functional joint was observed in 10 weeks. Limitation of motion was demonstrated by 40° active flexion and 40° extension.

the so-called minor injuries to the dorsum of the hand and fingers can be materially lowered. Recognition of accident prevention as the best treatment cannot be ignored, but trauma having once been established, it is imperative that these "minor injuries" not be treated by "adhesive tape bridges" nor plant first-aiders but immediately sent to the plant physician for proper evaluation and treatment.

Experience in hand surgery should be such as to qualify the physician to deal properly with these injuries. Too many or improper operative procedures may do more harm than too little surgery. Standard operative methods are of little value since each injury presents a problem of repair unique unto itself. Different techniques may produce better results in the hands of some operators while in others failure may be the result. The approaches given by the author have proved superior to other methods in this series. Simple extensor lacerations present little difficulty for successful repair. Complicated, more severe extensor injuries present some of the most complex problems of repair in hand surgery. Functional results are poor.

Surgical approaches at present leave much to be desired.

(5592 Santa Fe Avenue.)

Whose Responsibility?

PREPARATION for retirement should begin at the age of 18. Our cultural pattern somehow neglects those things which give people the capacity to overcome problems in old age. Needed are inner resources, cultivated over the years, that will provide meaningful activity—not "busy" work. These abilities must come from within, and cannot always be absorbed passively from participation in senior citizens' groups. Who should take leadership in giving today's worker a philosophy of living for tomorrow? Is this the physician's responsibility? If it is given sensibly to the physicians, where in the medical curriculm does the student acquire this knowledge or have his first exposure? It appears that a reorientation of many who are concerned must be accomplished, starting with the pre-medical advisers.

—From the Report of the Round-Table on Employability, at the Teaching Institute on Occupation and Health, held by the Association of Teachers of Preventive Medicine, Kansas City, Missouri, November 13, 1955.

An Analysis of the Industrial Physician's Activities

IAN MACLACHLAN, M.D., I.M.D., Medical Director
Carrier Corporation, Syracuse, New York

DURING May, 1955, we conducted an analysis of the assignments of doctors, nurses and clerks in our Medical Department. Our objective was an improvement in work methods. A by-product has been certain information about the activities of industrial physicians that may be of help to educators who are planning courses for doctors intending to enter industrial medicine.

The essential part of an analysis of this type is the minute-by-minute recording of every task performed for a period of one week. In our analysis this provided a fairly close look at what our industrial physicians actually did with their time and, therefore, by inference, a closer look at the type of knowledge and skill they should have to do their jobs adequately.

Some background material will assist in placing our activities in perspective. Carrier Corporation manufactures air conditioning, refrigeration and heating equipment of all sizes. Our manufacturing processes range from heavy machining, welding, and assembly and press work, to light bench assembly. During May, 1955, the corporation had 8,598 employees, with 5,642 of them working in Syracuse, New York, where two large plants and the headquarters of the company are located. The remainder of the employees worked in field offices, other plants, and small sheet-metal shops throughout the United States and Canada.

The Medical Director and his assistant are employed full-time, to care for employees located in Syracuse and to maintain a staff relationship to personnel outside of Syracuse.

The information contained here therefore concerns industrial physicians who are working in a fairly big light-to-moderately-heavy manufacturing company largely concentrated in one place but with many of the problems of dispersion. Their experience is not common to all practicing industrial physicians, notably those in the chemical industry, but it is shared by many.

The Analysis

IN WORKING out the details of our analysis we wished to simplify the classifying of the various tasks performed and recorded in this minute-by-minute fashion, and therefore the activities of the Medical Department were itemized before the study was started. During the study, the recording of activities was fitted into the predetermined classification.

The classification was designed to cover all the activities performed by the Medical Department. For convenience in discussions, plannings, and the writing of policies and procedures, it has been our custom to divide the functions of our industrial medical program into four parts:

1. Selection for employment and placement at suitable jobs.
2. Treatment of injuries and diseases.
3. The medical aspects of the prevention of occupational injuries and diseases.
4. Maintenance of employees' health.

Part 1 includes pre-employment, return-to-work, transfer and similar examinations of applicants and employees, and their placement at suitable work.

Part 2 includes complete treatment of occupational injuries and diseases and limited treatment of non-occupational injuries and diseases.

Part 3 includes industrial hygiene and safety activities, and the performance of periodic occupational examinations.

Part 4 includes health education, health counseling, and the performance of periodic health examinations.

Our classification contains these four items, which might be called the "direct" part of the Medical Department's work, plus certain other "indirect" activities—such as planning and problems concerning medical personnel—that are performed so that the department will have the people, procedures and facilities it needs to carry out its direct activities.

Table I shows this classification and the time spent on each activity by each of two doctors, one the Director of the department and the other his assistant, during a fairly normal five-day week in May, 1955.

The statistical data given in Table I, and elsewhere in this paper relate to the Syracuse plants only.

It is perhaps necessary to point out that the total time, 38 hours, represents working time. This does not include time spent traveling between plants, at lunch, and on similar activities.

Comment

THE FIRST thing that becomes apparent is that the performance of physical examinations and the treatment of injuries and diseases is still, and probably always will be, a major portion of the

TABLE I.

	Director		Assistant	
	Time Minutes	Percentage of Time	Time Minutes	Percentage of Time
1. Selection and placement	286	12.5	732	32.1
2. Treatment of injuries and diseases:				
(a) Occupational	237	10.4	498	21.8
(b) Non-occupational	268	11.7	357	15.7
3. Medical aspects of the prevention of occupational injuries and diseases	145	6.3	107	4.7
4. Health maintenance	315	13.8	130	5.7
5. Planning:				
(a) Personnel division staff meeting	186	8.1	0	0
(b) Medical Department staff meeting	51	2.2	51	2.1
6. Problems concerning medical personnel	28	1.2	3	0.1
7. Records	222	9.7	42	1.8
8. Workmen's compensation insurance	79	3.4	133	5.8
9. Facilities planning and maintenance	26	1.1	98	4.3
10. Training	101	4.4	61	2.7
11. Financial	23	1.0	10	0.4
12. Supplies	1	0.04	0	0
13. Research	28	1.2	10	0.4
14. Professional societies and social service organizations	291	12.7	47	2.1
Total - Minutes	2287	99.7	2279	99.7
Total - Hours and Minutes	38:07		37:59	

TABLE II.

	Director		Assistant	
	Time Minutes	Percentage of Time	Time Minutes	Percentage of Time
1. Selection and placement	286	12.5	732	32.1
2. Treatment of injuries and diseases	505	22.1	855	37.5
3. Prevention of occupational injuries and diseases	145	6.3	107	4.7
4. Health maintenance	315	13.8	130	5.7
Total	1251	54.7	1824	80.0

ordinary industrial physician's job. Table II shows the time devoted to direct activities. Of this time, most of the Items 1 and 4 were spent doing examinations; Item 2 was spent on treatment; and Item 3 was spent doing plant tours (no occupational examinations were done this particular week). Therefore, the Director spent about 50% of his time and his assistant spent about 75% of his time, doing examinations and treating injuries and diseases.

Physical Examinations

ALTHOUGH many hundreds of thousands of physical examinations have been done in industry, they are still not the precise tools they might be. For the most part every doctor has worked out his own examination procedures and standards. The latter tend to be based on his own relatively narrow experience. In industrial medicine we have no large body of experience—such as that available to life insurance underwriters—to help us estimate the risk involved in hiring or placing a man with a physical impairment. The establishment of standards based on wide experience would be useful. This would not result in the exclusion of more people from work; rather the reverse. It is certain that many people are now excluded because the examining physician prefers to play safe rather than take an unknown risk, or because his own experience incorrectly influences him to estimate the risk too high.

In the matter of procedures a practical approach is required. The ordinary practicing industrial physician can devote only a limited amount of time to each examination; to say that he should devote more is to beg the question. Our study indicates that the routine pre-employment examination takes 10 to 15 minutes of the doctor's time and the most extensive periodic examination about one hour.

To be practical, examination procedures have to be designed to give the maximum amount of information in the time available. The most unsatisfactory answer to this problem is to use an elaborate, time-consuming procedure that must be skimped because of lack of time. It would be helpful if more teaching and research efforts could be directed to standards and procedures for industrial physical examinations.

Placement

THE INDUSTRIAL physician spends a considerable percentage of his time assisting employment managers and supervisors in the proper placement of employees, particularly employees with handicapping impairments. Instruction in this subject will definitely increase his effectiveness. In most cases placement is no particular problem. Most jobs can be performed by the majority of adult men. Those jobs that are designated as women's jobs can be performed by the majority of adult women. Problems in placement arise when certain difficult jobs have to be filled or when a suitable job must be found for an employee with an impairment. It is our personal opinion that the mechanics of placement should be kept as simple as possible. It is our practice to treat each placement problem as an individual case and to rely on the cooperative effort of the well-informed employment manager, supervisor and doctor rather than on an elaborate mechanical system of job classification and employee categorization. Our experience with such systems is that they are difficult to administer and clumsy in operation.

Treatment

TABLE III shows the number of cases seen by our two doctors during the five days under study and during the year ending 10/31/55.

All our cases of industrial diseases were contact dermatitis, most of them mild. Our experience indicates that, with the exception of these few cases, treatment in industrial medicine is concerned with the care of occupational injuries and non-occupational diseases.

Occupational Injuries

THE FULL-TIME industrial physician cannot be skilled in the more difficult operative techniques

TABLE III.

	Occupational		Non-occupational	
	Injuries	Diseases	Injuries	Diseases
Five Days Under Study	32	2	2	29
Year Ending 10/31/55	1278	43	167	1364

of surgery. To gain and retain these skills requires constant practice which he, of course, does not obtain. Therefore, he must have a surgical consultant, or consultants, and must establish rules for governing the point at which he will refer cases on to the consultant. In establishing these rules he must first recognize that it is in the best interests of the patient and the company that the injured man be given the best treatment available, and, second, he must evaluate his own capabilities objectively.

Table IV shows our experience with occupational injuries during the year ending October 31, 1955.

TABLE IV.

	Number of Cases	Percent
Total number of cases	8924	100.0
Treated by nurses	7646	85.7
Referred by nurses to industrial physicians	1278	14.3
Referred by industrial physicians to surgical consultants	125	1.4

The industrial physicians treated 90.2% of the cases referred to them; the remainder, 9.8%, were referred by them to consultants. Our normal procedure is to refer cases that require more suturing than suturing of skin, that require plaster casts, that require hospitalization, that are not responding to our treatment, or that we are not able to diagnose.

To do our job properly we should be as familiar as possible with traumatic and orthopedic surgery, not including—for the reasons given above—the more difficult operative techniques. Some of this can be taught at a school of industrial medicine but the school's major contribution should be to increase our knowledge of accident prevention programs, workmen's compensation law, and the procedures involved in employment, job classification and placement; knowledge that will help us manage each case so that the injured workman suffers the least amount of lost time, permanent disability, and economic damage.

Occupational Diseases

AS NOTED above, all our cases of occupational diseases were contact dermatitis. Our experience indicates that instruction in dermatology is essential for the student of industrial medicine.

The fact that we had no cases of any other occupational diseases may leave us open to the criticism that we had cases but failed to recognize them. This may be true, but it is no more necessarily true than that cases of typhoid fever are bound to occur in a town with proper sanitation facilities. To a growing extent, in the manufacturing industry at least, industrial diseases are becoming analogous to typhoid fever in that they are being prevented and thus forgotten. Nevertheless, the student of industrial medicine must become familiar with clinical toxicology, so that he will not miss an occupational disease when one does occur, and so that he will be able correctly to rule out an industrial toxin as the cause of a pathological condition under investigation.

Non-Occupational Diseases

WE GIVE only limited care for non-occupational diseases and injuries. Treatment in these cases properly is the job of the family doctor. In general, our policy is that for minor ailments, such as headaches and head colds, we give immediate treatment. If more attention is necessary, the family doctor should be consulted.

For major illness, such as a heart attack occurring at work, we give every possible assistance until the patient is transferred to the care of his personal physician.

There is no limit to the extent of medical knowledge the industrial physician should have to do this part of his job well. However his need for proficiency in diagnosis and prognosis is greater than his need for proficiency in therapy, since in the most difficult cases therapy is not his responsibility. It is probably not the duty of the school of industrial medicine to ground the student in general medicine, particularly in diagnosis and therapy. Some attention, however, should be given to prognosis. The industrial physician is constantly having to give opinions involving a knowledge of prognosis; quite often his opinion, because it is not formed on a broad enough base of knowledge, is little more than an educated guess. The industrial physician cannot be blamed for this. What information there is concerning prognosis is scattered widely through the literature and textbooks and expressed in the most general terms. The schools could perform a great service by leading the way in a more scientific, statistical approach to prognosis as it applies to industrial medicine.

Medical Aspects of Prevention

DURING the period of our study the Director spent 6.3%, and his assistant 4.7%, of their time on this activity. In each case most of the time was spent on plant tours.

The Director spent a small amount of time on discussions and correspondence involving either safety or industrial hygiene. Normally some time during the period would have been spent doing occupational examinations. During the year ending October 31, 1955, our frequency rate was 3.1 and our severity rate was 166. We had 43 cases of contact dermatitis and no other occupational diseases.

The adequate performance of this activity by the industrial physician requires a knowledge of industrial safety and industrial hygiene. Both of these disciplines are concerned with control; the former with the control of mechanical exposures, the latter with the control of chemical and physical hazards. This control is partly engineering and partly medical. Engineering control is the responsibility of the industrial hygienist and the

safety engineer working through management. Medical control is the responsibility of the doctor. The doctor must have a general understanding of the safety engineer's and the industrial hygienist's function and a detailed knowledge of his own.

Maintenance of Employees' Health

IN THIS part of our program we have assembled those activities—health education, health counseling and periodic health examinations—that are directly concerned with assisting employees in the maintenance of their health.

At the present time the borderline between industrial medicine and non-industrial medicine lies in this area; while there is no question of industry's right and responsibility to select and place employees and to prevent and treat occupational injuries and diseases, industry's rights and responsibilities are not so well defined in the area of the prevention and treatment of non-occupational illness.

Good health involves proper nutrition, housing and clothing, the discovery and correction of remediable impairments, and the discovery and control of progressive impairments. All of these may be purchased by those who have the ability to pay for them. It has been our experience that there is a definite correlation between health in these terms and the economic status of the individual.

A company contributes to the health of its employees by increasing their ability to purchase health; by paying good wages, and by providing certain additional benefits, most particularly group insurance coverage. Despite this, many industrial employees tend to neglect two important health needs. The average group insurance plan includes hospital and surgical expense and hospital medical expense; as a rule no provision is made for ambulatory diagnosis or ambulatory treatment. The employee must pay for this type of medical care out of his pocket, and he will do so if the need appears to him to be urgent. If it does not so appear, he may prefer to use his money for some other purpose, with the result that many impairments are not discovered and many that are discovered are not treated. It probably serves no useful purpose to censure him for this; it is a fact of life based on his economic status.

The problem of how to provide the industrial employee with the ambulatory diagnosis and ambulatory treatment he cannot, or will not, pay for affects industrial medicine in two ways. First, it is the duty of the industrial physician to help his management decide whether they have a social, moral or business responsibility to pay for all, or any part of this type of medical care. Second, the industrial physician and his management must decide how much of this type of medical care is to be provided by the in-plant industrial medical service.

Reduced to its simplest terms, it is a problem of who will pay for, and who will supply, the service. A number of possible solutions have been suggested and used: group insurance plans, union health clinics, complete medical care plans operated by employers, provision of more than the usual amount of non-industrial medical service by the in-plant industrial Medical Department. Further solutions to this problem, and the instruction of the student in its fundamentals, should be given high priority by schools of industrial medicine.

Indirect Activities

A SIZABLE portion of the industrial physician's time is spent in indirect activities. In our study the Director spent more time in this type of work than his assistant. It is safe to say that the amount of time a Director will spend in such activities will increase in proportion to the plant population for which he is responsible, especially if he has to do much traveling. Training in some of the techniques of business management is therefore desirable. This training should equip the doctor to hire and supervise medical personnel; to conduct and take part in meetings; to talk to, and to write reports for, businessmen; to enter into financial arrangements with part-time physicians, consultants, medical laboratories and hospitals; to write a budget for his department, and to understand the functions of other departments of the industrial organization. Since, in most cases, the industrial physician will be a member of the personnel staff of his company he should be well trained in the techniques of personnel administration, employment, labor relations, wage and salary administration, employee benefits administration, and industrial training.

Certain indirect activities are worthy of special notice, *records*, for example. In our study this activity occupied a considerable portion of the Director's time. It is important that it should, because the development of a good system of record keeping, including statistics, and the maintenance of that system are the keystone of preventive industrial medicine.

We have not yet seen, or read about, a completely satisfactory record system for industry. Such a system should provide a legible, readable, concise but complete medical history of each employee and, at the same time, information concerning the current health status of the company population as a whole. It must do this and yet be simple and capable of being operated by a minimum of personnel. Training in record keeping is essential for the student of industrial medicine. In addition, schools of industrial medicine would perform a great service by developing simple, efficient record keeping techniques.

Facilities planning and maintenance also deserve special notice. Sooner or later every industrial physician has to design and equip a medical dispensary or a first aid station. Most of us embark on this enterprise quite unaware of the principles involved. The results do not always promote a smooth flow of patients or efficient operation of the Medical Department. Unfortunately we cannot always depend upon the architect to compensate for our deficiencies in design or

upon salesmen to compensate for our lack of familiarity with equipment needs. The schools of industrial medicine can be of real service in these respects.

The student of industrial medicine should be encouraged to take an active interest in *professional societies and social service organizations.* This will counteract a tendency for his practice to isolate him from his colleagues in other specialties, and from the efforts his community is making to promote general health. He will find that the time he devotes to these organizations will be repaid in benefits both to himself and to his company.

Summary

TWO INDUSTRIAL physicians, employed in the manufacturing industry, kept a minute-by-minute record of their activities for one week. An analysis of this record indicates the type of knowledge and skill these doctors should have to do their jobs properly. Based upon this analysis, a number of suggestions are made concerning the subject matter of a course in industrial medicine.

The analysis showed that the physicians spent a large portion of their time doing physical examinations and treating injuries and diseases. It is therefore suggested that emphasis should be given to instruction in traumatic and orthopedic surgery, not including the more difficult operative procedures; and instruction in general medicine, most particularly diagnosis and prognosis. It is also suggested that there is a need for standards for physical examinations that are based on wide experience and a need for a more scientific, statistical approach to prognosis as it applies to industrial medicine.

No specific mention has been made of psychiatry, psychology, mental health, morale, or human relations. This is not because these subjects are not considered to be important in the practice of industrial medicine but rather because it is felt that they are intimate components of medicine, selection procedures, health counseling, industrial relations, and business management, and therefore should be part of the instruction given in those subjects.

The need for training in clinical toxicology is recognized.

Training in industrial safety and industrial hygiene is considered essential. It is suggested that the doctor should be given a general knowledge of the safety engineer's and industrial hygienist's function and a detailed knowledge of his own.

At the present time the borderline between industrial and non-industrial medicine lies in the area of the maintenance of employees' health, particularly where this concerns the prevention and treatment of non-occupational illness. It is suggested that the student be instructed in the appropriate medical principles, and that he be given an understanding of the social and economic factors involved.

Certain indirect activities are performed by industrial physicians so that their department will have the people, procedures and facilities it needs to carry out its direct activities. It is therefore suggested that the student needs training in some of the techniques of business management, a general knowledge of industrial organization, and a more detailed knowledge of personnel functions. Instruction in record keeping and facilities planning is also considered to be important. It is suggested that schools of industrial medicine would perform a great service by developing efficient record-keeping techniques. Finally, it is recommended that students be encouraged to take an active part in professional societies and social service organizations.

(300 South Geddes Street.)

"Hath Yet His Honor and His Toil"

WITH advancing age we receive unexpected rewards and compensations. We escape slavery to convention; we detect the superficial things and pay attention to the significant; we enjoy being patient; we have outgrown our keenest acrimonies; we are free of uneasy craving; we are no longer pompous and self-regarding; we have a feeling of immense relief from the number of dangers we have escaped; we have advanced from what was promised to what is fulfilled. This is not to say that we must rest on our oars. A survey reported this year in *Industry* reveals that 64% of the world's great achievements have been accomplished by men who have passed their 60th birthday. Between 60 and 70 years of age, 35% of the world's great achievements were accomplished; 23% between 70 and 80; and 8% after 80. Sir William Van Horne, builder of the Canadian Pacific Railway, said no man comes to the subconscious coordination of details necessary to control a vast system until he is 60. And if we forsake the mundane things of business to seek a lesson in knight errantry, we find that when the first lances of all Christendom were Chandos of England and Du Gueselin of France, John Chandos was over 70 and blind in one eye. Retiring and soft-spoken he was, but when the earth stirred to a slow thunder of armies the most dreaded device on a shield was still the red pile of Chandos.

—From "Growing Old Successfully," in *The Royal Bank of Canada Monthly Letter*, Montreal, December, 1955.

Dermatological Problems in Industry

A Panel Session—by the IMA Committee on Dermatology

Reported by
JOSEPH V. KLAUDER, M.D.

THE PANEL SESSION on "Dermatological Problems in Industry," convened in the Lecture Room, Memorial Auditorium, Buffalo, at 9:00 A.M., Thursday, April 28, 1955. Joseph V. Klauder, M.D., Philadelphia, Chairman of the Committee on Dermatology of the Industrial Medical Association, called the meeting to order and introduced the following members of the panel, who are also members of the IMA Committee on Dermatology:

John G. Downing, M.D., Formerly Professor of Dermatology, Boston University School of Medicine and Tufts Medical College, Boston.

John Dalton, M.D., Professor of Dermatology, University of Indiana, Indianapolis.

Raymond R. Suskind, M.D., Professor of Dermatology, University of Cincinnati and the Kettering Laboratory, Cincinnati.

Earl D. Osborne, M.D., Professor of Dermatology, University of Buffalo School of Medicine, Buffalo.

With Dr. Klauder presiding, the meeting proceeded to the discussion of the assigned topics: "Diagnosis of Occupational Dermatitis," "Patch Tests," and "Treatment." Following this a question and answer period was scheduled.

Diagnosis—Occupational Dermatitis

IN INITIATING the discussion of "Diagnosis," Chairman Klauder read an excerpt from a publication of an English dermatologist on occupational dermatosis in which he stressed the importance of history: "The merest hint that some preliminary investigation may be necessary before the diagnosis is accepted, brings the dermatologist's competence into question and induces a state of passive resistance. The workman has never had anything wrong with his skin before he adopted his present employment. There is nothing wrong with his general health, his blood is pure . . . . half the workmen in his factory suffer from this complaint. To the lay public, only two skin diseases are known: The unemployed suffer from eczema, and those in industry suffer from contact dermatitis." The Chairman said that that quotation reflects his experience and doubtless evidences that human relations and human reactions are the same throughout the world.

It was announced that the discussion of diagnosis was to be confined to contact dermatitis—eczematous dermatitis. The latter is the predominating pattern of eruption of occupational dermatitis. Exceptions embrace a limited number, perhaps 12 to 15 different diseases of the skin, in a given geographical area, that have a different pattern and are distinctive of occupational causation—for example, oil folliculitis, chloracne. Time will not permit diagnostic discussions of these distinctive eruptions nor dermatoses resulting from an infection, e.g., anthrax, nor the many and varied cutaneous reactions directly or indirectly the result of trauma or injury.

The Chairman opened the discussion of "Diagnosis." In his experience a thorough history facilitates diagnosis of occupational dermatitis—it is frequently necessary to verify the claimant's history and to obtain additional information from an employment source.

Pertinent, also, is knowledge of industrial processes, of allergenic substances encountered in different occupations, and of concentrations of a variety of substances that exert primary irritant action. For example, the solution in the spinning vat in the making of nylon comprises about 5% sulphuric acid. The worker's hands are in and out of this solution. Does that concentration exert irritant action? This is doubtful since patch test studies with increasing concentrations of sulphuric acid did not show positive reaction until 10% was employed. Another example was oxalic acid. Patch test studies did not show positive reaction until a saturated solution was employed, namely, 10%. Oxalic acid as used in industry entails exposure of the worker's hands to a solution much less than 10%.

In addition to consideration of concentration, the degree and duration of exposure are important.

A complete examination of the entire skin surface is necessary. Diagnosis of the presenting eruption is of prime importance. For example, an eruption on the hands alleged to be occupational may be psoriasis or lichen planus; these are not of occupational causation.

DR. DOWNING: I agree with Dr. Klauder on the importance of a definite history. I also ask the claimant for his concept. If necessary, I obtain information from the Medical Director, the industrial hygienist, the chemists, etc., regarding the exposures of the claimant. The claimant may inform me that he is exposed to chrome; a more reliable source of information denies this. I then conduct a thorough examination—from head to toes. I rule out an endogenous disease—psoriasis, for example. I then examine the area of maximum exposure. One should not forget that the ankles may be such a site from contact with dust. I then consider duration of exposure. Difficulty in diagnosis of occupational causation may arise in the case of a worker on the same job for years. In a case of this kind a careful history is required to elicit causal factors. I then come to the patch test. I find that with complete history fewer patch tests are necessary; I think this is better for the patient and also myself. In summary, then, the history, the time of onset, the areas affected are important. The older I get the fewer patch tests I perform on these patients.

DR. OSBORNE: I would like to discuss one phase that

I regard as most important in industrial dermatology, namely, the differentiation of dermatitis from a primary irritant versus sensitization dermatitis.

The important features in differential diagnosis are: Dermatitis from a primary irritant appears at the exact site of contact with the irritant; whereas, sensitization dermatitis never remains localized, it spreads out peripherally. There is absorption, and widespread eruption may ensue. There are always satellite vesicular lesions around the area of contact.

In dermatitis from primary irritants there invariably are large blebs and not multiple small blisters. These large blebs are confined to the area of contact with the irritant. In sensitization dermatitis the vesicles are small and very likely spread. The picture is that of an eczematous eruption and not a frank contact burn.

In dermatitis from primary irritation, the chemical burn runs a typical course—a crust forms at site of the blebs and healing ensues in about one to two weeks depending upon the extent and severity of the dermatitis. In sensitization dermatitis the course is longer; depending upon the severity the course may vary from one week to as long as eight to 10 weeks.

The history is helpful; for example, contact with an irritant in concentrated form, such as turpentine, formaldehyde, acids, and alkalies. Sensitization dermatitis, on the other hand, almost always arises from substances that are *per se* not productive of a chemical burn.

The patch test is of considerable importance in differential diagnosis. I need not discuss this, since the patch test will be a later subject.

CHAIRMAN KLAUDER: I would like to discuss dermatophytosis in relation to occupational dermatitis of the hands. As is well-known, surveys of a large group show a 30% to 40% incidence of dermatophytosis of the feet. I do not believe it can be satisfactorily proved that dermatophytosis of the feet or hands is of occupational origin. It is common to see dermatophytosis of the hands in association with dermatitis of the hands of contactant cause (eczematized tinea). I disregard the dermatophytosis; my judgment of occupational origin is based on whether it is reasonable to ascribe the dermatitis (eczematization of the tinea) to exposure to an eczematogenous substance.

DR. SUSKIND: I would like to remark about the difference between occupational dermatitis from primary irritant or allergenic origin and non-occupational dermatoses.

The history and patch test are of importance in determining if contact dermatitis is of non-occupational origin.

The following circumstances are to be considered in differential diagnosis of occupational dermatitis:

1. Exposure to physical agents. These may give rise to an inflammatory reaction that is often indistinguishable from a contact dermatitis.

2. Allergic or eczematous reactions due to infectious agents. These inflammatory reactions occur on the hands and forearms and are of two varieties — (a) the entity called infectious eczematoid dermatitis due to pyogenic organisms that have a potent allergenic capacity; and (b) the "id" reactions arising from mycotic infection, such as, epidermophytosis. These reactions are vesicular, eczematous, and, from an immunological viewpoint, are allied to the allergic contact problem. These infections—superficial mycosis and pyodermas of hands and forearms —irrespective of an allergic component are to be differentiated from dermatitis arising from an exogenous allergen.

Differential diagnosis also concerns seborrheic dermatitis and atopic dermatitis.

Seborrheic dermatitis, like contact dermatitis, may occur in exposed areas and has to be differentiated from contact dermatitis. On the other hand, it has been my experience that an individual with seborrheic dermatitis is much more likely to develop a primary irritant or allergic type of contact dermatitis than one with normal skin.

Since atopic dermatitis occurs on the forearms it is to be differentiated from occupational dermatitis.

Complications by either seborrheic dermatitis, atopic dermatitis, mycotic or pyogenic infection sometimes may explain why an occupational dermatitis does not clear up.

Definitions

CHAIRMAN KLAUDER: It is desirable to discuss terms. Dermatosis is any disease or pathologic condition of the skin. Dermatitis is an inflammatory disease of the skin (subcategory of dermatosis). Eczematous dermatitis is an inflammation of the skin that resembles eczema. The word "eczema" usually connotes an endogenous cause in contrast to contact dermatitis.

Contact dermatitis is manifested as eczematous dermatitis and arises from a contactant cause: (a) a primary cutaneous irritant; (b) an allergenic substance. A primary cutaneous irritant is a substance in that concentration and period of exposure that produce a cutaneous reaction. There are weak and strong irritants. A strong irritant—caustic substance—produces a burn in contrast to eczematous dermatitis caused by a weak irritant.

The term "contact dermatitis" usually implies a more or less acute dermatitis. In some quarters the term is used with a broad meaning—a dermatitis arising from friction or pressure, such as under a truss, or from prolonged exposure to a weak irritant, such as soap and water. I believe the term is used too loosely without rationalization or demonstration of the excitogen or contactant agent.

Patch Test

THE NEXT topic for discussion is the "patch test." I believe the patch test has been over-emphasized and unjustifiably exploited. It is erroneous to think that diagnosis of occupational dermatitis can be made by routinely performing a patch test.

A patch test serves two purposes—to define that concentration of a given substance that exerts a primary cutaneous reaction, and to determine if a person is allergic to a given substance. It should be emphasized that patch tests are indicated only in diagnosis of sensitization dermatitis.

In an analysis I made of 2,407 cases of occupational dermatoses, 15% had a sensitization dermatitis. I would estimate that in one-half of this 15% the history and clinical evidence justified diagnosis without performing a patch test.

An important pitfall in the use of the patch test is interpreting positive reaction caused by primary irritant action as an allergic reaction. To avoid this pitfall the concentration of the tested substance is of great importance. The concentration should be such that no primary irritant action is exerted, not only on the "normal" skin, but also the skin of a person who has a low threshold of cutaneous irritability (a "sensitive" skin in contrast to a "tough" skin). A

low threshold of irritability is always present during the acute phase of a dermatitis of endogenous or exogenous origin.

To circumvent this question of what concentration to employ in a closed (covered) patch test one may perform an open patch test. This consists of placing on the skin undiluted a few drops of the suspected substance or a comparable small amount if not a liquid. It is allowed to dry and is left uncovered.

Another phase of the patch test to be discussed concerns whether it is necessary to perform the test on the normal skin near the site of suspected sensitization dermatitis. From my experience I doubt the necessity of this.

DR. DOWNING: There has been considerable talk about primary irritants and sensitizers. We who do liability and industrial accident work see many so-called patch tests, which makes one wonder whether all dermatologists and physicians really know the difference between a primary irritant and a sensitizer. For example, if pure phenol were painted on everyone's skin, a chemical burn would result. If we use a percentage of 1:100 phenol on everyone's skin, only a few would react. If we wash our hands with gasoline, very few of us would be bothered unless we had become sensitized. However, if we soak a piece of cloth in gasoline, apply it to the skin, and cover it, we would all get a reaction, showing that under those circumstances it is a primary irritant.

One might say that this never happens. However, I saw a young dermatologist dramatically demonstrate the result of a patch test with an irritant liniment. He knew that this would cause a positive reaction inasmuch as under such circumstances it is a primary irritant.

Perhaps patch tests are being overstressed by various insurers and industrial accident commissions. We should all be careful about doing these tests. The different chemicals to be used in patch testing are listed in various books on allergy and industrial medicine. People who are doing this sort of work should study these books.

Primary irritants should not be used in direct contact with the worker's skin, and all employers should be careful that their employees avoid direct prolonged contact with primary irritants. Primary irritants are easy to recognize, but sensitizers create quite a problem. A man may work with a sensitizer for many years before he realizes he is becoming sensitized. Briefly, reactions on the hands occur from concentrations of the chemicals to which he is exposed, the method of exposure, and the length of exposure. All these factors must be considered.

DR. OSBORNE: Even in dealing with known allergenic substances, there is a considerable percentage of instances where the patch test is negative yet you can prove the dermatitis is due to a certain allergenic substance. Just last week one of the best papers I have heard in many years on the subject was presented by Stephen Epstein, of Wisconsin, showing that in nickel dermatitis (and he believes that this is true in other metal dermatitis), 25% of the patch tests to either straight nickel or nickel solutions are negative in known, proved cases. Now if that is true it poses a severe and marked limitation on our estimated value of patch testing. As I remarked at the clinical session, patch tests are indispensable. One should perform tests with all the material to which the patient is exposed. That concentration of the tested substances that produces an irritant reaction should not be used; it is necessary to know the concentration that does produce such action and to use a weaker concentration. To avoid aggravation of the dermatitis, even generalization, do not perform patch tests during the acute stage; wait until it has subsided. Perform as few times as possible to avoid widening the base of sensitization. The patch tests should not be placed too close together, to avoid a reaction from one spreading to the site of the adjacent test. I have seen instances in which reactions could not be differentiated one from the other.

CHAIRMAN KLAUDER: What about the open versus the closed?

DR. OSRORNE: I agree with Dr. Klauder that if the open tests can be done, this method is preferable to the closed method. In patch testing with all solvents, the liquid is applied on the skin and then allowed to evaporate. If any covering is used, it should be applied loosely, but always after evaporation of the solvent.

DR. SUSKIND: I think most of the important points regarding the use of the patch test and its misuse have been covered. I will present an additional list of hints—practical hints—concerning the patch test. This could be labeled "The Do's and Don'ts of the Patch Test."

Other speakers have pointed out that irritating concentrations should not be employed—one has to know proper concentrations. One should also employ, in the diagnostic patch test, control substances the eliciting characteristics of which are known as well as control subjects with relatively normal skin.

One should use a sufficient area of skin—at least two square centimeters—for ordinary materials, and larger areas if fabrics are tested.

One should apply these materials for a sufficient length of time—24 hours for known potent sensitizers, and 48 hours for substances of relatively low sensitizing capacity.

When you read the patch test you should allow 15 to 20 minutes to elapse following the removal of the patch before making your observation. The pressure of the patch or solid materials may temporarily mask the inflammatory reaction and, if read immediately, the result may be regarded as negative. On the other hand, transient erythema and dermographism elicited by the pressure itself may give the false impression of a positive response. If the erythema persists for only a few minutes, it should be regarded as negative.

One should also observe the sites of application for delayed reactions. Persons who are sensitive, perhaps at a lower level, will show delayed reactions in 72 hours.

An important point to stress is that results of patch tests should corroborate clinical evidence. A positive patch test is not prime evidence of etiology, it is only corroborative evidence, and is an aid in establishing an etiologic diagnosis. This information obtained from patch testing should be integrated with the history and physical examination.

To confirm clinical evidence of a sensitization dermatitis, the patient can be re-exposed to the suspected allergen for proof of sensitization dermatitis.

Another "do" concerns the fact that the chemical composition of some substances occurs after exposure to the air. Solutions such as soaps and detergents, when used for patch testing, should always be freshly prepared.

About some of the "don't" in patch tests:

Do not use any substance of an unknown nature; a severe reaction may result, for which you are liable.

Do not patch test with a potent sensitizer like, for example, 2, 4-dinitrochlorbenzene. Such a patch test can sensitize the patient.

Do not be stingy with the size of the area of the skin tested. Use a large enough area because the factor of exposure-per-unit-area is rather important.

And then, as Dr. Osborne pointed out, do not patch test if the patient has a widespread eczematous dermatitis.

Finally, do not use the result of the patch test as sole evidence of causation. It is only corroborative.

Localized Sensitization

CHAIRMAN KLAUDER: How about patch tests near the site of an alleged sensitization dermatitis?

DR. SUSKIND: I think that there is a difference of opinion as to whether one should patch test near the site of dermatitis. There are some who maintain that local hypersensitization does not exist and that once the skin is sensitized via contact at a local site, the skin as a whole is sensitized and that any area will be reactive to the allergen.

On the other hand, others believe that cutaneous hypersensitivity may be localized, and in order to avoid a false negative reaction it is advised that the patch test be performed near site of the dermatitis.

I have observed patients with eczematous dermatitis of the hands who did not react to an obvious inciting agent when the test was performed on the back, but they did react to the test performed on the healed area of the hand or volar aspect of the forearm. Therefore, I think there is some evidence that there might be, if not local hypersensitivity, a greater reactivity to a specific allergen in a local area.

(Here Dr. Downing advised that if one suspects sensitization dermatitis and performs a patch test, it is desirable to retain the patient in one's office or clinic to observe, in the event of high degree of sensitization, a beginning reaction. In this event the patch is removed to prevent a severe reaction that may spread. He cited an instance of a candy maker who was highly sensitized to cinnamon oil. He performed a patch test and dismissed the patient. When he next saw the patient he had a generalized dermatitis that required hospitalization.)

Concentration of Tested Substance

CHAIRMAN KLAUDER: I think it is desirable to enlarge upon an important aspect that has been discussed, namely, the proper concentration of substances used in patch testing. Dr. Downing referred to several lists that give proper concentrations. There is such a list in the text by Schwartz and his co-authors on occupational dermatosis, and also in Sulzberger's text on allergy. In some instances I believe the concentrations recommended in these lists are too high. For example, the concentration recommended for potassium dichromate is 0.5%. I purposely tested some patients with fairly diffuse eczema with 1.0%, 0.5%, and 0.25% solutions of potassium dichromate and observed positive reactions to all of these dilutions. There was no collaborating evidence that these patients were sensitized to dichromate. I regarded the positive reaction as that of a primary irritant in consideration of the low threshold of irritability of the eczematic skin.

Moreover, the concentrations listed are appropriate for the "normal" skin ("normal" with quotation marks), because, after all, what is "normal?" The definition of a primary irritant is an individual one: It is that concentration that causes a reaction on that individual patient; it is not fixed.

There is considerable variation in the reactability of the skin. The patient with a sensitive skin—"Smith"—will have a low threshold; "Brown," who has a different skin, will have a high threshold of irritability, and concentrations listed for "normal" do not take into consideration the patient with a low threshold of irritability.

The open method of patch test circumvents this question of what concentration should be used. In the case of some substances the open test is mandatory. For example, some monomers are insoluble in water; it is not appropriate to use a solvent as a diluent; the monomer as is exerts irritant action.

Of course, the question of concentration applies only to substances that are inherently primary irritants. It does not apply, for example, to tobacco, nylon, rubber.

DR. OSBORNE: One more phase I think is important. This concerns specificity of chemicals. Industrial physicians should be sure they are testing with the same substance to which the patient is exposed, rather than using a set of 12 or 15 or 20 conventional chemical solutions recommended in a textbook as proper solutions for testing.

Let me illustrate. Hypersensitivity can be so specific that the individual will react to potassium dichromate, but will not react to chromic acid. There are many other examples of that. One must be sure that he is testing with the actual substance that the individual is contacting.

Treatment—Occupational Dermatitis

DR. OSBORNE: One of my pet subjects concerns the avoidance of all forms of irritant medicaments in treatment of industrial dermatosis. A common error, and this does not apply only to industrial physicians, but also to dermatologists and to general practitioners, is the employment of potential sensitizing substances in treatment of a common ordinary dermatitis. As a dermatologic consultant I frequently see patients who have a secondary dermatitis from overtreatment and from sensitizing medicaments.

I propose to discuss a simple therapeutic armamentarium for the industrial physician. First as to antiseptics:

I would select zephiran chloride as a simple, nonsensitizing antiseptic solution. I have never seen sensitization dermatitis from zephiran chloride. One can use the water solution, which is colorless, or the tinted tincture.

A second antiseptic solution that has a very low index is Neomycin in water. It is simple to make: 200 milligrams in eight ounces of water, or a stronger solution—50 milligrams to one ounce. The former concentration for routine use suffices. Its potency is retained at least two or three months; it is non-irritating, and is an excellent local antiseptic. If dissolved in physiologic saline solution, it serves an additional purpose as a wet dressing.

As to an antiseptic ointment, I recommend a simple 5% boric acid ointment. As is well known, boric acid should not be used on a large area of denuded skin, but a 5% ointment is safe on localized abrasions or localized dermatitis.

Another antiseptic ointment is Neomycin with or without polymyxin. Plain Neomycin ointment and boric acid ointment, I think, suffice for industrial practice.

As to a wet dressing, I have already mentioned Neomycin in sodium chloride. That is an excellent

dressing and is antiseptic. Another is Burow's solution. It is available in tablet and in powder form. Burow's solution is non-irritating; I regard it as one of the most valuable wet dressings.

Simple powders that are astringent and are of use in hyperhidrotic or sweaty skins to prevent eruption are ones containing tannic acid, boric acid, and either zinc stearate or zinc oxide. One I favor contains 10, 20, 30% boric acid, and 10 to 30% tannic acid in zinc oxide or zinc stearate.

For simple, soothing ointments to apply to any type of skin injury I would recommend:

First, 5% boric acid ointment, U. S. P.

Second, aquaphor, which is also U. S. P.

Third, unguentum hydrophilicum, U. S. P. That is hydrophilic ointment. There is no need to use a patented preparation. The advantages of a hydrophilic ointment are that it is greaseless, it does not mess up a hairy area, and it can be used in any region. Such ointments absorb considerable moisture —sweat, exudation, discharge—and one can incorporate a number of medicaments up to about 20% in any of the hydrophilic ointment bases.

Fourth, plain petrolatum.

Fifth, U. S. P. polyethylene glycol—carbowax ointment. I include that because some persons react to petroleum derivatives, which of course include petrolatum. Polyethylene glycol, however, is not in that category.

Regarding soothing lotions—first, calamine lotion, U. S. P., is an excellent preparation. It is available with and without phenol. If phenolated calamine lotion is used containing 1% phenol, there is danger of phenol poisoning if the lotion is used over the entire body surface. That is possible.

Second, U.S.P. calamine liniment. This contains oil; for this reason some people prefer it to the lotion which may be too drying.

Third, an excellent preparation—a little more oily and some prefer it to calamine liniment—is nivea skin oil. It contains 0.5% menthol and 3% chloretone. Chloretone is probably the least sensitizing of any of the good local antipruritics.

In my opinion that covers all of the medicaments that are necessary in treatment of occupational dermatitis, whether it is caused by primary irritants or allergenic agents.

Now, a few of the "don'ts."

First, do not use sulpha drugs or penicillin locally on the skin. This is an "old chestnut," but I should like to reiterate some reasons for it. Sulpha drugs are among the most sensitizing of all chemicals known. Penicillin should not be used, not because it is not effective, but because of potential sensitization, thereby preventing the subsequent use of penicillin in treatment of a serious disease. There are many antibiotics just as good as penicillin, such as Neomycin, which is not given internally, and still other antibiotics that are only used locally. However, Neomycin is to be recommended. Do not use penicillin.

Second, do not use nitro-furazone derivatives. Furacin is an example of its sensitizing index. Some cases of sensitization dermatitis from this source last weeks and months. There are other preparations to be preferred, such as Neomycin.

Third, do not use proprietary remedies. Some of the worst cases of sensitization dermatitis, in my experience, have arisen from the use of proprietary remedies in industrial practice. The nurse uses them routinely; the doctor knows nothing about it.

Fourth, do not use steroids in sensitization dermatitis unless the patient is removed from further contact with the causative allergen. There is no reason for using cortisone or ACTH or any of the newer ones in such cases until the causative allergen has been demonstrated and contact ceases. There is danger of a rebound phenomenon, and the patient, four six or eight weeks after starting steroid treatment, may be worse than at onset if exposure to the allergen continues.

Finally, if a patient with a non-occupational skin disease is treated in the clinic at the place of employment and the dermatitis is made worse, New York State laws require that treatment be continued until recovery. I think a firm rule should be —do not treat non-occupational diseases of the skin.

Discussion

CHAIRMAN KLAUDER: We come now to the question-and-answer period.

DR. LEBARON: Will penicillin in an ophthalmic ointment sensitize the patient, comparably to its use on the skin?

DR. OSBORNE: Yes. I am opposed to the use of penicillin ointment on any mucous membrane. Not only in industry, but also in private practice I see instances of sensitization dermatitis around the eyelids and around the nose from regional use of penicillin. From such use I think sensitization dermatitis is readily induced.

COLONEL HOLLAND (United States Army): I would like some discussion of the so-called "prophetic patch test." We have need, in the military service, for patch testing, to predict what a particular formulation would do if impregnated in military clothing and equipment. Such material should be tested prior to exposing hundreds of thousands of men in uniform to a particular formulation in clothing or equipment until its safety is determined beyond peradventure. We have need of patch tests. In a paper in which I was a collaborator, we reported indications of the so-called "prophetic patch test" for that purpose, but we came to place a very low value upon its utility for purposes of prognosticating what a formulation would do. We are leaning upon a reed; and I think a discussion of that would be most welcome.

CHAIRMAN KLAUDER: There are three methods that serve the purpose mentioned by Colonel Holland. One is the "prophetic patch test" of Schwartz and Peck that comprises only two applications of the tested substance. Another is the repeated insult method that comprises application every other day for 15 consecutive times, a rest period, and then the final or challenging application. In consideration of the greater number of applications the repeated insult method I believe is more likely to determine allergenic action of a given substance than is the first mentioned method. Allied to the repeated patch test is the method employed by Brunner and Smiljanic (*Arch. Dermat.*, 66:703, 1952). This consists in the repeated daily application to the skin of the test material under conditions resembling normal use rather than application as a patch test. The third method is the usage test.

There are shortcomings in all of these methods. I think by employing a combination of the three, substances with a high allergenic index should be detected. After all, this is the real issue.

DR. DOWNING: If a manufacturer asked me the value of testing any textile with this method (prophetic patch test) on two or three hundred persons, I would reply that I do not think one will get

very far. I will cite a specific example: Some years ago there was much furor about sensitization dermatitis from shorts. A peculiar feature of this dermatitis was its onset on the penis, generally the foreskin. Through swelling the penis became tremendously enlarged; the eruption then spread to the scrotum and subsequently elsewhere.

I have always been of the opinion that there was a local susceptibility of the genital region to the allergen, doubtless contained in the "filler" of the shorts. In testing such material I see no purpose of placing it on the arm. Tested material should be worn at site of maximum exposure. The usage test is much better, regardless of how it is performed provided it contacts the same area of skin that will be exposed when the material is in actual use. In other words, in testing material to be made into shorts, the material should be tested in the proximity of the scrotum. Similarly, the arms should be tested if the proposed use of the material will contact them.

With outer clothing there is a difference; the greatest contact with outer clothing is the wrists and ankles. Hence, I believe there are pitfalls in these prophetic patch tests conducted on normal persons, regardless of whether 200, 500, or 1000 are tested.

DR. OSBORNE: I am glad this was brought up because it is a very practical subject Last year we had occasion to do a piece of work for one of the companies in this area, in connection with substances to impregnate fabrics for use by the Air Force, and we tested these substances with prophetic patch test methods, just as a preliminary. Of course, I never was in favor of it, but it was negative. We got no positive reaction, nor did we expect it. None of the people had been sensitized previously.

The only method is the "use" test—the repeated insult method is a modification of the "use" test. We put pieces of this fabric, impregnated with the chemicals, on 100 arms (nurses, doctors, and interns) and 4% got a severe reaction. That is a very severe thing when you get four out of a hundred with a severe reaction. The prophetic patch test gave us nothing.

DR. HOGUE (Akron, Ohio): Dr. Osborne, you did not discuss the antihistamines.

DR. OSBORNE: I did not, since I do not think they have any use in the treatment of contact dermatitis. Their only desirable effect, and that applies only to some preparations, is to make the individual sleepy and drowsy. I would subscribe to their use at night for this effect, but not for an antihistaminic effect since they do not exert this action in contact dermatitis.

DR. HOGUE: How about on the skin?

DR. OSBORNE: I am opposed to their use on the skin. They are all sensitizers; some are worse than others. There is no indication for the use of antihistamines on the skin.

DR. DOWNING: They have been removed from nonofficial remedies. They have been condemned since sensitization dermatitis may occur after their use.

Barrier Creams

DR. CARRIER: I would like some comments on the protective creams—for protection against cutting oils, and poison ivy dermatitis—especially the silicone creams.

CHAIRMAN KLAUDER: I think they have their use. Their value should not be over-exploited. I take a middle-of-the-road position. Their ingredients must rationalize their use. For protection against aqueous solutions, oils, solvents, one or more ingredients should be insoluble in one or the other of these mediums. Barrier creams should be selected not only as to ingredients but also as to their vehicle.

DR. SUSKIND: I have been interested for some time in the subject of the protective efficiency of silicone creams. I have attempted to correlate the results that we have observed with laboratory tests, i.e., the stability of films of each cream with the results of controlled usage appraisals of each cream in industry. In this manner I studied a fairly large number of commonly-used non-silicone-containing creams and silicone-containing creams. At the risk of hurting some feelings, I shall state the conclusions: Most of the non-silicone-containing creams, such as soaps in vanishing creams with various emulsifiers and perfumes, rigid films that are either reputedly water-soluble or water-insoluble, greases that are supposed to plug pores to avoid absorption, are essentially no better than the washing techniques that go along with their respective uses. There is evidence to demonstrate that when these creams are used in a variety of exposures they have little repellent value. Their effectiveness is dependent strictly upon the hygienic technique of washing employed before application of the cream and repeatedly during the work shift. Because the workman uses the cream he washes his hands several times a day and the irritant or allergen does not have an opportunity to be absorbed or to exert its effect.

As to the new type of cream containing silicone, regardless of whether one uses a 350 or 50,000 centistokes viscosity fluid the silicone is water-repellent. The type of vehicle and the concentration of the silicone in the cream are important. On these two factors depend whether an intact film can be developed.

Silicone creams that have a suitable vehicle and a silicone content above 30%, provide protection against aqueous irritants and some aqueous sensitizers. There are two such commercially available preparations—one contains 30% silicone in petrolatum, the other contains 52.5% silicone in bentonite. These creams will form water-repellent films and can be used for irritating aqueous exposures; they cannot be used for repelling low-boiling-range petroleum distillates, such as gasoline, naphtha, mineral spirits, petroleum ether.

As to heavy oils, such as insoluble cutting oils, there is another problem. If the vehicle of the silicone cream is an oily one, e.g., petrolatum, the film of silicone cream will be destroyed by the oil. But cream containing the 52.5% in bentonite is not so destroyed by some cutting oils. With a good wash schedule the use of such a silicone cream may prevent oil folliculitis and keratoses.

If, however, a silicone cream is made up with a vanishing cream base, it is only as protective as the vanishing cream. Dr. John Shaw (in a recent publication in *Arch. Dermat.*) reported that silicone in a vanishing cream base was removed from the skin by soap-and-water and also by a water-soluble coolant just as rapidly as ordinary cosmetic vanishing cream.

DR. OSBORNE: Dr. Klauder, I think Dr. Suskind should say something about the efficacy of preparations to prevent primary irritation as against sensitization.

DR. SUSKIND: I think that is a good point. We do not know whether a barrier cream film on the hands really remains intact throughout a period of work exposure. If an individual, for example, is highly

sensitive to chromate and cannot avoid an exposure to hexavalent chromium, it is unlikely that any protective cream will do any good; and that, I think, applies to persons who are very sensitive to metals or organic substances. We have observed, however, that many persons who are exposed to aqueous irritants or some sensitizers (nickel, phenylethanolamine, dyes, plastics, etc.), will be protected against the irritant if the silicone content of the cream is of adequate concentration. Such creams seem to repel the irritant or sensitizer for a sufficient time to provent cutaneous reaction.

DR. DOWNING: Would you recommend the use of a protective cream in conjunction with rubber gloves—for example, by telephone linemen and persons engaged in wet work?

DR. SUSKIND: I definitely would not. We had some experience with the use of silicone cream and rubber gloves in a kerosene exposure. This involved women engaged in Magna-flux inspection of metal parts, whose hands were exposed to kerosene six to eight hours a day. They agreed to use the cream in lieu of gloves (this was an industrial appraisal of the cream). When we came back a week later we found out that some of them used the cream in conjunction with rubber gloves. Three or four of the 14 women who used the cream and wore rubber gloves as well developed vesicles on the hands, which we regarded as sweat-retention vesicles. I would not recommend the use of a silicone cream in conjunction with rubber gloves.

CHAIRMAN KLAUDER: The area of the hand is 423 square centimeters. In a study I conducted 5 grams of different barrier creams evenly spread on a piece of linen 146 square centimeters approximated the amount that ordinarily would be applied to the hands. The thickness of that film was .011 to .031 of an inch. Many barrier creams are stressed as an "invisible glove." I believe the more visible the film on the hands the more protective it is and the more difficult to remove.

DR. DWANE: In the food processing industry we eliminate a lot of so-called "product rash" by frequently washing the hands. I believe that one should replace some of the natural skin oils with bland vegetable oils after washing. Am I correct?

Also I would like some comment on the use of hexachlorophene soap.

CHAIRMAN KLAUDER: I think you are right about the desirability of using an emollient after frequent hand washing. I think the industrial physician should pay attention to the use of emollients at the end of a workday, particularly in winter and after the use of solvents. I think an effective and simple one is equal parts of anhydrous lanolin and petrolatum.

The next question concerned hexachlorophene soap. Dr. Osborne, will you discuss this?

DR. OSBORNE: I think many dermatologists have seen sensitization dermatitis from hexachlorophene. The chemical is a sensitizer, although the incidence of sensitization dermatitis is less than 1%. Personally, I prefer to use a high-grade super-fatted soap and some other form of skin antiseptic, if indicated, such as the Neomycin-in-water solution.

DR. M. J. FINE: In areas and jobs where washing facilities are not available, are there any advantages in the use of hand-cleansers that do not require the use of soap?

CHAIRMAN KLAUDER: You refer to the waterless cleaners?

DR. FINE: That is right.

CHAIRMAN KLAUDER: The original waterless cleaners usually contained deodorized kerosene. I would guess a considerable percentage. These cleansers are comparable to cleansing the hands with kerosene and are not desirable, more especially for the eczematic skin. They are potential causes of dermatitis in relation to the duration and degree of their use. The newer waterless cleansers have been modified.

After a recess Dr. John G. Downing assumed the Chairmanship of the meeting. . . .

CHAIRMAN DOWNING called the meeting to order, and said: After diagnosis of occupational dermatitis is made treatment is instituted. At the end of three months to the dismay of the dermatologist the dermatitis has not recovered. This is a cause of worry; the dermatologist wonders if the insurance carrier will attribute this non-recovery to lack of skill of the attending physician. Formerly, if such an occupational dermatitis had not recovered in three months, Dr. Downing said that he would regard the original diagnosis as erroneous. Subsequently, he modified that opinion and considered that a number of circumstances might account for the non-recovery. He thought discussion of this pertinent, and asked Dr. Dalton for his opinion.

DR. DALTON discussed non-specific (non-allergic) polyvalent sensitivity in explanation of the continuation of an occupational eczematous dermatitis. He did not believe that a polyvalent sensitivity ensues after a contact dermatitis. He pointed out that the skin, the site of acute dermatitis, is always in a state of heightened irritability, but this disappears after subsidence and disappearance of the dermatitis. Continuance may be attributed to an attempt to desensitize or "harden" the worker to the causal agent by continued exposure. If this does not occur, the dermatitis may become chronic.

Other reasons are: uncooperation of the patient in carrying out treatment; exposures outside of occupation; co-existence of other skin diseases that may be masked by the contact dermatitis; complication with fungus infection, not only of the hands, but also of the feet and crural region; and the question of the general state of health of the patient, and dietary and vitamin insufficiency.

Non-Recovery of Occupational Dermatitis

DR. OSBORNE: We were discussing the reasons for non-recovery of industrial dermatitis. Dr. Dalton has given us several reasons for failure to heal. In most cases of dermatitis venenata the average duration is two to four weeks. However, in a certain percentage of patients the period is more prolonged—six, 10, or 12 weeks. In addition, there is still a certain percentage of patients who fail to get well for months and even years. What are the causes? Why does this occur?

Dr. Dalton mentioned the general status of the patient—the fact that other types of allergy may be a complicating factor, such as a basic underlying urticarial tendency. If the patient reacts with a red dermographism, I believe that is an indication that he probably has an underlying food allergy that may raise the level of reactivity of the skin so that his skin reacts to many minor skin irritants.

One should consider a history of hay-fever and asthma. Patients with an allergic history include the atopic individual. In my experience, especially in metal cases—exposure to nickel or chrome—in a certain percentage the dermatitis continues for two, four, six, eight or 10 years. Such patients have an allergic history and the dermatitis of many eventu-

ates in an atopic dermatitis. On Tuesday, at the clinic, I showed two or three examples of that type. These patients had a family history of allergy and of infantile eczema. As their dermatitis continued, it gradually changed into atopic dermatitis with erythema, thickening, and scaling of the flexor surface of the forearms, the cubital and popliteal spaces.

The problem in these industrial cases is when does occupational exposure cease to play a causal role and when does the cutaneous disease become the individual's problem? In other words, when does the insurance carrier cease to pay compensation and to defray cost of treatment? Of course, I refer to New York State laws governing workmen's compensation and other states whose laws are similar. In New York State it is difficult to terminate such cases.

I have at least six or eight such patients who now have chronic atopic dermatitis. These patients received compensation for three, four, and five years, although I testified at compensation hearings that the original occupational exposures have nothing whatever to do with their present state except as a precipitating cause.

There is another reason for failure to heal and that is the development of secondary infection. Many cases of industrial dermatitis become an infectious eczematoid dermatitis with the development of pustules, and require treatment from that standpoint. That is rather common. Another complication is the development of dyshidrosis following dermatitis venenata. This is common in individuals who have sweaty skins, especially the hands, following a dermatitis venenata. The dermatitis venenata apparently produces a closing or a shutting off of the sweat apparatus so that sweat is not delivered to the skin surface. Many patients with dyshidrosis develop a secondary infection; the clinical picture is then an infectious eczematoid process, although the original dermatitis has disappeared. These are common reasons why dermatitis venenata fails to heal.

Hand-Cleansing

CHAIRMAN DOWNING: Earlier in the session when Dr. Suskind spoke about protective creams he mentioned hand-cleansing. How does he advise the industrial worker to cleanse his hands? One of the statements we make to such patients is this: "You have a dermatitis; get away from soap and water."

DR. SUSKIND: I might begin by answering one of the questions raised earlier in the session and which remained unanswered because of the recess. That is the status of waterless hand cleansers.

Waterless hand cleansers are a special kind of hand cleansers used, as you know, in areas and situations in which running water and soap, or detergents, are not available. They are used by workers in the field, in camps where water is at a premium, and in shops that do not have proper sanitary facilities. Dr. Klauder stated that many waterless hand cleansers contain kerosene. That is essentially true. The usual formulation of the classical waterless hand cleanser includes a low-boiling-range petroleum distillate like kerosene, or mineral spirits, lanolin, water, some soap, perhaps, and an emulsifier. Often perfumes are added to mask the odor of the petroleum distillate.

These formulations have been on the market for many years and unfortunate incidents have occurred as a result of their use. In recent years, however, attempts have been made to find a substitute for the petroleum distillates. At present there are under study—and some of them have already been marketed—formulations that contain petroleum fractions of the light oil type. These fractions are essentially of the paraffinic or isoparaffinic series. Their range of distillation is near that of kerosene, but they cannot be regarded as kerosenes. They are good solvents and essentially are not irritating to the skin in the concentration in which they are used in the hand cleansers. They are also used in conjunction with synthetic detergents in some forumlae.

Frankly, waterless hand cleansers should be used only where there are no facilities for a good soap or synthetic detergent and water method of cleansing. They should not be substituted in any industry for the classical wash.

Dr. Downing asked me to comment on methods of hand cleansing. It would take more time than I have to discuss the components of hand-cleansers. However, I can say something about the objectives of hand-cleansers:

1. They should cleanse the skin with minimum effort.
2. They should not irritate, defat, or abrade the skin, when used repeatedly.
3. They should not do damage to the plumbing, and should be easily dispensed.

Powdered hand cleansers are effective, and in most instances they are composed of a soap and a vegetable abrasive. I am not sure it is even necessary to use the vegetable abrasive for many types of industrial soil. A suitable non-irritating synthetic detergent may also be added to the formulation to increase its efficiency for specific use. Time will not permit discussion of the many formulations of cleansing powders and liquids. The objectives are clear: They should be effective and non-hazardous.

DR. OSBORNE: I would like to know what you regard as the best over-all method of hand cleansing.

DR. SUSKIND: The selection of the proper cleanser depends upon the specific soil to be removed. I regard the best general method of cleansing as either a bar soap or a powdered soap with or without a vegetable abrasive.

In such a formulation soap should be "neutral," e.g., containing no free alkali. If a powder is preferred, the soap content should be in such concentration as to be effective. When cornmeal content is high the effect of the soap is limited. It is desirable to examine the formulations carefully to determine that they contain a sufficient quantity of soap and perhaps an added synthetic so that the preparations will be effective and non-irritating. Often the bar soap is more effective than a powdered soap with vegetable abrasive. For use in a large plant bar soap is uneconomical.

A question was raised concerning the incorporation of such antiseptics as hexachlorophene. In an industry in which infections of the skin are not a problem there is no reason to employ hexachlorophene or Actamer (Actamer is 2, 2-thiobis ((4,6-dichlorophenol)), which has antimicrobial properties comparable to hexachlorophene). The latter is probably less sensitizing and less irritating than hexachlorophene, although both have a fairly low sensitization index. I think they can be used effectively when the incidence in the shop of pyodermia is high. By repeated use of an antiseptic the incidence of pyogenic infections of the skin may be decreased.

A MEMBER: Dr. Suskind, you did not mention what percentage of soap should be used in powdered hand cleansers.

DR. SUSKIND: Such cleansers should contain 25% or more of soap. If the formulation contains 50% soap, it will be a much more effective cleanser. The usual percentage of soap in commercial powdered hand cleansers is about 25%. There is some variation from that average. Cost is often a problem, and decision of what preparation is to be used is made on the basis of the cost per pound. There is not too much difference, however, between the cost of a cleanser that contains 40% or 50% soap and one that contains about 25%.

CHAIRMAN DOWNING: Dr. Klauder, as you all know, has conducted studies and has written on the subject of hand cleansing. I think we should hear from him.

DR. KLAUDER: One should not speak of ideal hand cleansers, if they are not commercially available. I, therefore, think it is desirable to become oriented as to the availability of hand cleansers for the industrial worker.

The following was shown as a slide:

STUDY OF 103 HAND-CLEANSERS FOR INDUSTRIAL WORKERS

57 gritty powders	pH 9.2 to 10.7 2 were 7 and 6.9 4 contained syn. deterg. 3 were alkaline
52 tested	carbonate 27 phosphate 36 borate 15
16 liq. soaps	pH 9.2 to 11.7
10 liq. non-soap deterg.	6 were alkaline
14 waterless cleansers	11 were alkaline
4 abrasive pastes	pH 8.9 to 11
2 abrasive cake soaps	pH 9.3 and 10.5
103 all but 10 alkaline	

Of the gritty powders the predominating abrasive is either cornmeal or wood flour. There is little difference between many of these gritty powders employed as hand cleansers, and soap powder and washing powder employed for kitchen and household purposes. They both comprise soap powder with one or the other of the alkaline salt detergents.

Reference was made to a "neutral soap." This comprises one in the manufacture of which the amount of alkali and of fatty acids is in exact molecular proportion, so that the finished product contains no free alkali or free fatty acid. The word "neutral" does not refer to the compound soap which is not neutral in the chemical sense. Since soap is the salt of a weak acid (fatty) and a strong alkali (sodium or potassium hydroxide) it is alkaline.

All soaps, whether neutral, superfatted, or containing a minimum amount of free alkali, hydrolyze in aqueous solution and are always alkaline. The alkali of hydrolysis is much greater than the amount of free alkali in the soap. Too much emphasis, therefore, need not be placed on neutral soaps or on a minimum amount of alkali or on superfatted soaps as an index of good soap. I determined the pH of a 1% aqueous solution of 36 toilet soaps. The range was from 9 to 11.

It is difficult to say what is a good soap. One hears the statement, "Use a mild soap." I have yet to know what is a mild soap. What is a harsh soap?

In all probability the same fatty acid is used in the manufacture of most commercially available soaps and, as stated, in aqueous solution they are all alkaline.

I cannot answer the question, what is the best of the 57 commercially available gritty powders for the industrial worker? I do not think there is much difference between any two of this group. Indeed, I do not think this is the issue of hand cleansing. I think attention should be directed to harmful measures of hand cleansing. I refer to the use of solvents, especially kerosene. It is desirable to instruct the worker to avoid kerosene and to make available a higher boiling range of petroleum distillate like mineral seal oil, spindle oil, ideally (but more expensive) light medicinal mineral oil. These latter will remove grease, grime and paint without the defatting and irritant effect of kerosene.

Much will depend upon the tolerance of the worker's skin. I have examined many persons with normal hands who informed me that a variety of solvents have been used for years as hand cleansers without untoward reaction. This likewise applies to excessive use of soap as a hand cleanser 15 to 20 times a day. For these reasons it would be difficult to put into effect an ideal plan of hand cleansing in an industrial plant.

Nevertheless, I think attention should be directed to avoidance of potentially harmful methods of hand cleansing; of unnecessary hand washing, of its avoidance by supplying gloves and dispensing an emollient, especially in winter. Attention should be directed to the least harmful method of removing ink, dye, stain, viscous and malodorous substances; to the use of buffering agents, e.g., acetic acid, after the use of sodium hypochlorite to remove dye.

In my experience the greatest problem in hand cleansing is the worker who has dermatitis of the hands. The alkalinity of soap contradicts its use; non-soap detergents do not suffice to cleanse. I know of no commercially available hand cleanser appropriate for this purpose. I advise the use of light medicinal mineral oil as a preliminary cleanser. This is followed by one of the commercially available sulphonated oil cleansers. If necessary, it can be mixed with cornmeal to make a mush, and in lieu of running water boric acid solution can be used.

DR. EDDY: Perhaps Dr. Osborne might have some ideas about fungus infection of the feet. I would like to hear him say something about the use of prophylactic foot-baths.

DR. OSBORNE: There are many here in the audience who attended the clinical session on Tuesday in which we covered that subject. I will try to summarize my views on that.

I happen to be the individual who developed the rubber pans, "wells," etc., for schools, and similar uses. There is no question at all that 1% sodium hypochlorite solution will kill all fungi, in water suspension; it never cures one case of ringworm of the feet and never should be used for treatment. However, there is a mass of scientific evidence, accumulated in recent years, that that is not the important thing in ringworm of the feet in industry.

The important thing (as has been shown recently by Dr. Baer and his co-workers in New York City) is that many normal skins contain potential pathogens, even though there is no sign of disease. It is probable that few, if any, cases of ringworm occur in industry. Individuals may already have the potential pathogens in their skins, never having had any attacks of ringworm of the feet in weeks or months or years gone by, and it is the conditions of employment that produce the flare-up of the ringworm—the increased heat and moisture, the wearing of heavy socks, heavy shoes, etc. These con-

ditions create the most favorable soil for the growth of the organisms. I seriously doubt that, with our present scientific knowledge, industry needs to worry about the transmission or acquiring of ringworm in shower bathrooms, because I think the evidence points to the fact that it probably never occurs.

DR. MEADOWS: Going back to the waterless hand cleansers, there has been a feeling in the petroleum industry that the use of any petroleum product will accelerate the action of an allergen on the skin. Wouldn't that be true of waterless hand cleansers?

DR. SUSKIND: Under ordinary circumstances the employment of a waterless hand cleanser would remove most of the allergens and, therefore, decrease the possibility of sensitization. Theoretically, if some of the allergen remains on the skin in the presence of a petroleum solvent or a surfactant (which some cleaners contain), it will be absorbed percutaneously to a greater degree.

DR. BELKNAP: In modern industrial medicine, we make pre-employment examinations and place the candidate in the proper job. In my own industry management goes along with that policy. We employ epileptics, deaf and partially blind persons, and men who have a hernia, who have had coronary thrombosis or a stroke, or who have diabetes. I sometimes have qualms when I examine a candidate who has thickened folds in the elbow or a history of dermatitis. Just where should I place him—in clean dry work?

I keep him out of the plating department, the screw machine department, and work entailing exposure to heavy oils, plastics, and solvents. On what job would you suggest such a person be placed?

DR. OSBORNE: I think that is a real problem. We, as dermatologists, are often asked: Shall we employ this man? I refer to persons who have a history of atopy, persons with chronic atopic dermatitis, and those who have the history of one or many attacks of dermatitis on the exposed parts. In the case of an atopic individual I would advise against employment in any industry where there is an allergenic hazard. Such a person should be employed in an office, where the work is dry, where there is no allergenic dust or exposure to other allergenic substances.

Perhaps you are aware of the experience of the Armed Services. It cost $7,500 to get rid of one atopic person after induction into military service. I feel that a comparable experience would apply to employment in industry. I think, too, that that applies to a person who has had repeated attacks of dermatitis. Such a person should not be employed in work entailing exposure to known chemical or inhalant allergens. The latter are sometimes more important than direct chemical contacts.

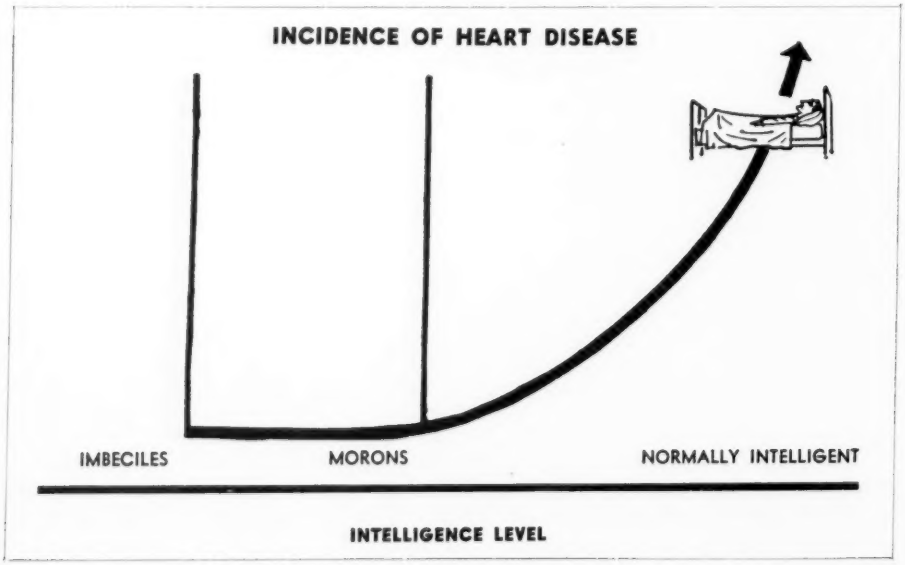
CHAIRMAN DOWNING: We hear a great deal about rehabilitation. To my mind one of the greatest fields for rehabilitation is with persons who have suffered an occupational dermatitis, for example, a trained worker who cannot resume his work on account of recurrent attacks of dermatitis. The case of this worker becomes a problem. Dr. Dalton, you did some work in this regard.

DR. DALTON: I have nothing to add except that the industrial physician, perhaps through consultation with the dermatologist, may work out placing this type of person in another department.

CHAIRMAN DOWNING: Our time is up; the session is adjourned.

(1934 Spruce St., Philadelphia.)

Intelligence Test?



Relationship between intelligence and heart disease was indicated in a paper on "Wasted Manpower" presented to the American Society of Mechanical Engineers by Trafford W. Bigger. Mr. Bigger cited that the incidence of heart disease was greater as the intelligence level rose.

—From *Management Methods*, October, 1955.

Treatment of Acute Plutonium Poisoning

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WITH THE increasing use of radioactive materials, an increase in the number of incidents of poisoning may be expected. In untreated cases, the major portion of an absorbed dose of plutonium is rapidly fixed in the skeleton and is eliminated at an extremely slow rate. Like radium, it continues to bombard the bone forming elements with alpha particles throughout life. The type of injury which may result, as we have learned from animal studies and case records of persons bearing body burdens of radium and mesothorium, is particularly disabling. Osteitis, bone necrosis with pathological fractures, osteogenic sarcoma and damage to the hematopoietic system may result.[1] To be most effective, treatment must be given during the first few hours following an accident and before the element is fixed in the bones.

The purpose of this paper is to outline a method of treatment of individuals who may receive by inhalation, ingestion or through a contaminated wound an estimated body deposit of plutonium greater than the 0.6 microgram limit which presently is accepted as safe.[2] Recommendations are based upon accumulated evidence from experimental animal work performed at many atomic energy installations together with limited clinical experience which we have had in treating humans. To date there have been no serious cases of plutonium poisoning in this country to our knowledge. We have treated, for experimental purposes, three individuals having small measurable amounts of plutonium deposits in the body, but all of which are too small to cause concern as indicated by urinary excretion. Two were treated with zirconium citrate and one with calcium ethylenediamine-tetraacetic acid (Ca-EDTA). The latter case was previously reported along with another case of Foreman.[3] With the passing of the years, routine urine studies of employees engaged in plutonium production indicate an increasing number of workers with measurable body deposits all of which are, however, less than the maximum permissible limit. This emphasizes the need for an effective method to treat chronic cases, which to date is not available.

It is now possible to detect amazingly small amounts of radioactive materials in the human body by urine assay. The maximum permissible amount of plutonium deposited in the body is .6 micrograms.[2] To help visualize the smallness of .6 micrograms, it can be said that if one were to make a very small dot on a piece of paper with a very sharp lead pencil, one would have approximately .6 micrograms represented in the dot. If the lead pencil were a plutonium metal pencil and we were able to disseminate the plutonium making up this dot uniformly into the air of a room 10 x 10 x 10 feet, we would have a plutonium air contamination approximately 10,000 times the permissible limit for a working environment. Six-tenths micrograms of plutonium represents some 84,000 disintegrations per minute. By urine assay it is now possible to detect a little as .05 disintegrations per minute in the excreted urine and from this estimate the plutonium body burden.

Zirconium Citrate

FOLLOWING reports of Schubert and coworkers[4-9] that zirconium citrate was effective in greatly increasing excretion and concomitantly decreasing bone deposition of plutonium and radioyttrium in rats, it was felt desirable to determine if zirconium would be effective in treating man. Studies with laboratory animals had indicated that zirconium was relatively non-toxic. No deaths to laboratory animals occurred when 1.5 grams/kg. of zirconium citrate was repeatedly injected into the peritoneum of rats.[5] No chronic effects were observed. The L.D. 50 dose for acute toxic levels was 1700 mg/kg. as zirconium. Within 24 hours after the injection of zirconium, 80-90% of the metal was excreted in the urine. The early work of Schubert[7] and White[8] seemed to indicate that the amount of plutonium or yttrium excreted in the urine was roughly proportional to the size of the dose of zirconium. From this work, they felt that the minimum amount of zirconium which would lessen the skeletal deposition of plutonium in acute poisoning was between 5.1 and 12.3 mg. per kilo. Zirconium administered 24 hours after injections of plutonium and yttrium prevented further depostion of the radio-elements in bone but had no other observable effect on their organ distribution. Hence the need for treatment of individuals as soon as possible after intake was stressed. By 1951, it was postulated, from animal work, that the most effective dose in treating plutonium poisoning in man would be at least 100 mg. of zirconium per kg. of body weight. For a

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70 kg. man this would equal 7 grams of zirconium. The preparation suggested by Schubert has the following composition.

100 cc. zirconium citrate solution
Zirconyl chloride 2.1 gram.
(Equivalent to 0.6 gm. of zirconium)
Sodium hydroxide U.S.P.—0.15 gm.
Sodium citrate U.S.P.—2.5 gm.
Water for injection U.S.P. q.s.

Citrate Toxicity

TO ADMINISTER 7 grams of zirconium would necessitate giving 29 grams of sodium citrate, a large dose, considering the evidence of citrate toxicity, as when multiple transfusions with citrated blood are introduced rapidly or when there is liver disease or obstruction to the hepatic circulation.[10-14] The danger is in depression of the serum calcium level of the blood and citric acid intoxication can and does occur, with a fatal outcome. Bunker suggests a possible relation between hypotension as well as difficulty in blood coagulation and an elevated citric acid blood level. Tetany is the usual sign of low serum calcium and 10% calcium gluconate should be given routinely when zirconium citrate is administered to prevent this. Sollman[14] points out that the safe intravenous dose of sodium citrate varies with the rate of administration, but recommends that the total dose should not ordinariy exceed 5 grams. These studies indicate that the sodium citrate is the limiting factor and not the zirconium in the intravenous administration of zirconium citrate. This has led to a search for a less toxic salt than sodium citrate but to date none has been found. Before giving intravenous zirconium citrate to an employee with relatively innocuous absorption of plutonium it was felt advisable to administer a small dose to an incurable patient. Fifty milligrams of zirconium as the citrate was administered to such a patient. Recovery of zirconium in the 48-hour urine sample was 81% and there was no evidence of toxic effect from this small dose.

Early in 1951 an incident occurred at the Hanford Works in which an employee received by inhalation and ingestion less than the permissible amount of plutonium. He was given repeated intravenous doses of 600 milligrams of zirconium at 5, 21, 98, and 118 hours after exposure. The rate of excretion of plutonium was increased by a factor of approximately three. The amount of sodium citrate administered along with each 600 mg. of zirconium was 2.5 grams. The 100 cc. of solution containing the 600 mg. of zirconium was administered over a period of about 10 minutes.

A second employee with a small fraction of the allowable body deposit of plutonium which he had received through a break in the skin, was given two doses of 600 mg. each of zirconium intravenously at 153 hours and 177 hours after the exposure. No increase was found in the urinary excretion rate of plutonium as a result of this small dose of zirconium given this late after exposure. No abnormal signs, symptoms or laboratory findings occurred in either case except for a bitter taste. When the zirconium citrate was administered, 10 cc. of 10% calcium gluconate was simultaneously given to both employees to prevent hypocalcemia. These results are as expected on the basis of animal work. Such small doses of zirconium cause little change in urinary excretion but minimize bone deposition as effectively as a dose 10 times as large. Since larger doses may be given only at some risk, it seems that the logical use of zirconium is in a small single dose given as soon as possible after accidental exposure to minimize deposition of plutonium in bone. We have had no other suitable cases for treatment with zirconium citrate.

Calcium Ethylenediamine-Tetraacetic Acid

RECENTLY Foreman and others have demonstrated that CaEDTA is effective in treating plutonium poisoning in animals and in man. EDTA mobilizes heavy metals from the body through its property of forming stable water-soluble chelates with these metals, which then are rapidly excreted via the kidney. It is introduced into the body fully combined with calcium as the calcium chelate. This prevents the danger of hypocalcemic tetany which otherwise might result through the combination of EDTA with the serum calcium. Calcium EDTA still functions in mobilizing plutonium because of its preferential affinity toward this element as compared with calcium. Calcium is displaced from combination with EDTA by plutonium and the material excreted as plutonium chelate. Calcium is excreted independently. CaEDTA is relatively non-toxic as shown by its increasing use with safety in treating poisoning with lead and other metals.

Case Study—CaEDTA Treatment

FOREMAN worked with us in treating experimentally a young chemist whose exposure by inhalation at a plant other than Hanford was presumed to have occurred seven years previously. It was estimated from his urinary excretion that his body burden was 1.2 micrograms. There has never been any indication of injury from the plutonium. The trial was carried out with the employees cooperation, as a test of the effectiveness of CaEDTA in increasing excretion rate in chronic plutonium poisoning. He was given 0.10 grams of CaEDTA in saline by slow intravenous drip on the first day, 2.0 grams on the second day in two separate doses, and 5.0 grams on each of the three succeeding days. The 5.0-gram dose was divided into two doses of 2.5 grams each in 500 cc. of saline with an interval of about five hours between the two daily treatments. A period of about 90 minutes was taken for each infusion. There was an over-all average increase in plutonium excretion of about 10-fold over pre-treatment levels during the five days of treatment. In animal experiments where it is possible to analyze tissues, it has been found that skeleton, as well as the soft tissues, is depleted of plutonium by the treatment.[15-16]

A second case was treated by Foreman elsewhere.[3] A 40 year old female technician received

an estimated body burden of about 0.5 microgram of plutonium through a contaminated laceration. Treatment was started on the fifth day after the accident with doses of 2.5 grams of CaEDTA given twice daily for 16 days except for two days. There was a marked increase in the initial excretion rate by a factor of about 100. The treatment apparently was less effective as time went on but even in the later days the excretion rate was more than 10 times greater than the control.

These two cases verify animal experiments which have shown that CaEDTA accelerates the excretion of plutonium. They emphasize further the need for early treatment since the normal rate of excretion drops off with such extreme rapidity that after the first 10 days increasing the rate by a factor as large as 10 would still give a daily urinary excretion rate of less than 1% of the dose.

Relative Effectiveness

THOMPSOM, Wager, *et al*[15,16,17] have administered plutonium to rats and dogs and made extensive comparisons of the therapeutic effectiveness of zirconium citrate and CaEDTA employing single and multiple doses with both prompt and delayed administration. In these studies the animal controls showed about 50% retention of the administered dose in the skeleton with another 20% in soft tissue, at the end of 30 days. The delayed zirconium citrate therapy was given 30 days after plutonium administration and was without significant effect. The prompt zirconium citrate treatment was given 30 minutes after plutonium administration and very significantly decreased the retention of plutonium in the skeleton. There was no significant effect on soft tissue retention. Prompt CaEDTA treatment significantly decreased bone retention but to a lesser extent than did zirconium citrate. However, soft tissue retention of plutonium was significantly decreased with CaEDTA treatment. Combination of the two agents resulted in a combination of the best effects of each.

To decrease bone deposition and soft tissue retention of plutonium, the early use of both zirconium citrate and CaEDTA would appear to be the treatment of choice.

When to Treat

TO DECIDE which patient to treat requires considerable judgment. It is extremely difficult to determine quickly even the approximate amount of plutonium which will become fixed in the body, as a result of an exposure. Analysis of the urine, which often gives an accurate estimate, is time consuming. Until this information is available, one must make a rough estimate, taking into consideration the mode of entry, degree of contamination of the air and surrounding materials, duration of exposure, etc. Measurement of alpha activity in a wound is most unsatisfactory with available instruments. Under exceptional circumstances, a quick estimate might be quite accurate, as when a known amount of plutonium is ingested. Under the usual circumstances, the estimate might be wrong by a factor of 10 or many times more. Treatment would be recommended when it seems highly probable that the maximum permissible limit (0.6 microgram) would be exceeded. The patient should then be supplied with the pertinent data. In borderline cases, the patient might be asked to give permission for treatment on the basis that, even if it were later determined that the procedure were not essential, it would at least add to our clinical experience, which is at present meager.

Recommended Treatment

FOLLOWING the decision that treatment is indicated, our trestment of acute plutonium poisoning would be as follows: Zirconium citrate solution (according to the method of Schubert) would be given as soon as possble and within the first four hours after plutonium introduction into the body. Hospitalization is desirable. Zirconium citrate solution is prepared in 150 cc. IV flasks and each 100 cc. contains 2.1 gm. zirconyl chloride. The dosage should be 25 mg. zirconyl chloride per kilo or 100 cc. zirconium citrate solution for a 180-pound man (81.6 kilo.) It should be administered intravenously, slowly, along with 10 cc. of a 10% solution of calcium gluconate.

Following zirconium administration or if zirconium citrate solution is not immediately available, CaEDTA (calcium ethylenediamine-tetraacetic acid) should be given. Ampules containing 1 gram of CaEDTA in 5-cc. solution are commercially available, and it is best given in normal saline or glucose solutions. The safest practice is to administer a test dose followed by a daily dose of 2 grams for five days. Stutzman, Department of Pharmacology, School of Medicine, Boston University, has recommended the following for CaEDTA administration based on animal experience and allowing a considerable factor of safety.

I. Route—intravenous drip only, not to exceed 3% solution.

II. Maximum dose per hour not to exceed .5 gm. per 30 pounds.

III. Maximum dose per day not to exceed 1.0 gm. per 30 pounds.

IV. Maximum dose per week not to exceed 5.0 gm. per 30 pounds.

V. Maximum dose per course (with seven days' rest between courses) not to exceed 7.5 gm. per 30 pounds.

VI. For the present, two such courses with seven days' rest between courses, should not be exceeded.

Further details of administration methods are described by Stutzman as follows. "Based on the present state of our knowledge the preferred method of administration is as follows:

"(a) Test dose: Ampules containing 1 gram CaEDTA should be used. One cc. from an ampule is diluted with 250 cc. of a 5% glucose or .9% sodium chloride solution suitable for intravenous administration. The 250 cc. should be administered by vein over a one-hour period.

"(b) Therapeutic regime: If no untoward signs are observed, and after an interval of not less than four hours, 1 gram (5 cc. from an ampule) is to be diluted with 250 or 500 cc. of saline or glucose isotonic solution as above and administered over one hour by intravenous drip. This dose should be administered twice daily for periods up to five days.

"(c) Present knowledge does not tell whether larger doses per day will be more effective."

It appears that the use of zirconium citrate and CaEDTA is also appropriate when necessary for treating acute poisoning by a mixture of fission products or individual fission products such as radioactive strontium, caesium rutherium or yttrium.

Other Measures in Addition to Specific Therapy

THE FOLLOWING additional measures would be taken depending upon the mode of entry of the plutonium:

1. *By inhalation*: Unfortunately we do not have any practical method for increasing elimination of toxic materials from the lungs via the respiratory tree. Treatment therefore is directed at increasing elimination via the urine and decreasing body deposit, when the plutonium passes from the lung into the circulation, soft tissues or bone. As an aid in following the course of therapy, a careful study of the daily urinary excretion curve for plutonium is necessary.

2. *By ingestion*: It should be remembered that the percentage absorption of plutonium via the gastro-intestinal tract is very small—about 0.005% to 0.01% of the dose.[18] If the dose is still considered significant, gastric lavage, using normal saline would be used to remove as much as possible of that remaining in the stomach. A mild laxative such as cascara segrada or mineral oil would be given to promote intestinal elimination. The use of only a mild laxative is indicated so as not to irritate the mucosa of the gastro-intestinal tract and possibly increase absorption.

3. *By contaminated penetrating wound or abrasion*: An insignificant scratch may be sufficient to allow entry of more than the permissible dose of plutonium into the blood stream, so prompt treatment is imperative. For extremities a tourniquet may be used to limit lymphatic and venous return while allowing arterial flow. Decontamination of the wound and surrounding area is necessary and treatment of a severe wound or hemorrhage may need to take precedence over other measures. Long continued washing of a wound with tap water alone or with soap is often effective. For the surrounding contaminated area, we also use a saturated solution of potassium permanganate followed by a 5% solution of sodium thiosulphate. The contamination is kept localized by use of cotton applicators. Serious consideration must be given to early excision of contaminated tissue when the nature of the wound makes decontamination ineffective as may be the case.

This procedure will depend upon the probable dose, location and type of wound, venous and lymphatic drainage of the area and the wishes of the patient after he has been given a full explanation of all known circumstances and the alternate procedures. Experiments with rats have indicated that over 90% of an intramuscularly injected dose of plutonium citrate, a relatively soluble form, is still present at the injection site after 24 hours and 60% by the end of 10 days.[19] If this is true in man, it would indicate that debridement may be helpful even after considerable delay in time. Brues produced a fibrosarcoma by 1 microgram of plutonium in the subcutaneous tissue of a rat.[19]

In all instances the fluid intake should be increased and salt intake limited in an effort to increase excretion.

Comment

THE AIM of early treatment of acute plutonium poisoning is to eliminate a high enough percentage of the total plutonium dose, so that only the maximum allowable dose, 0.6 microgram or less remains. Katz, Weeks and Oakley[20] in comparing the relative effectiveness of various agents for preventing the internal depositions of plutonium in the rat, found that CaEDTA was the most effective procedure for reducing soft tissue retention of plutonium and that zirconium citrate was most effective in preventing deposition in the skeleton. Further they found that the simultaneous administration of EDTA and zirconium citrate seemed to combine the good effects of both and reduce the retention to about 21%. Later work by Wager and Temple[20] working with dogs showed that zirconium citrate administration alone within the first four hours removed from 50 to 95% of the total administered dose of plutonium (up to 0.1 microgram per gram of body weight.)

If it be assumed that 95% removal is applicable to humans this would mean that plutonium doses up to 12 micrograms would be reduced to the maximum permissible limit of 0.6 microgram under the most favorable circumstances. With larger doses, however, for example 50 micrograms and with 95% removal, the amount of plutonium remaining would be 2.5 microgram and the maximum permissible limit would be exceeded by a factor of about 5. Therefore with high dosage, even 95% removal may not be enough and more effective methods of treatment are needed. However, one should remove as much as possible of a dose which exceeds the permissible limit, if the patient is seen early enough to allow significant treatment results. Following body intake of plutonium the effectiveness of presently available agents rapidly diminishes. If zirconium cannot be given within a few hours, it will be relatively ineffective and the effectiveness of EDTA also rapidly decreases with time.

Until such time as more effective methods can be developed for the mobilization and removal of large amounts, and of smaller amounts deposited over a longer period of time, the most exhaustive prevention and control measures for plutonium must be provided.

Summary

BASED on the extensive experimental work at various installations of the Atomic Energy Commission and limited clinical experience, a method of treatment of acute plutonium poisoning using both zirconium citrate and CaEDTA is recommended. Early treatment following an accident is effective in increasing excretion and decreasing the body deposition of plutonium in bone and soft tissues.

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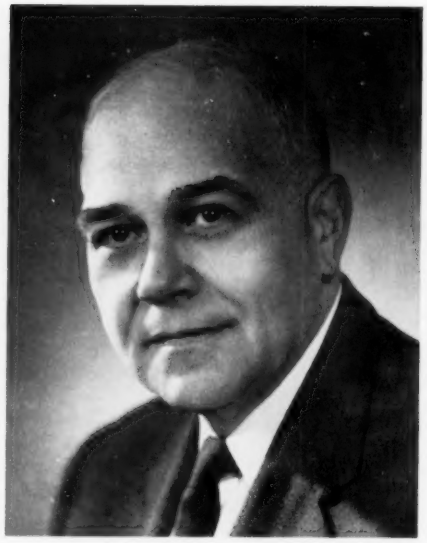
Rehabilitation After Death

OUR AGE seems to be smitten with a remarkable eagerness to do justice to the more questionable characters of history. Very recently, Marcel Pagnol, the dramatist, produced a play in Paris in which he tried to rehabilitate Judas Iscariot, who, according to him, was not at all the sordid traitor presented by conventional historians. The latest rehabilitation is that of Marshal Ney, henchman of Napoleon, later of King Louis XVIII. Having been sent to arrest the emperor, he went over to his side, and later was shot by the king after Waterloo. Rene Floriot, the well known French lawyer, has attempted in a scholarly book, to clear him of the two charges of treason that have been brought against him. The beheaded queens, Mary Stuart and Marie-Antoinette, have long since had their convictions quashed on appeal. Arguments have been put forth in favor of the Borgia family, whose culinary reputation is legendary. Louis XV and his entire century have been rehabilitated, including the gay ladies of the court, and even Caligula seems to have been a rather decent chap, at least before his mind gave way. If one believes numerous historians, pseudo-historians and men of letters, the judgments of history on men and events have often been hasty. However, there should be no half-way measures. Justice demands a serious review of all historical trials. Did King David send his captain into battle the better to woo his wife? Was Nero just a silly, twisted boy? Was Guy Fawkes merely trying to bring the House down with a witty practical joke? Perhaps Henry VIII was just a man whose wives didn't understand him. Were Genghis Khan and Attila the Hun just a couple of country lads who came to town for their holidays? These are only a few examples of the historical problems which are crying out for review, and veterans will be specially interested because most of these people were military leaders. Once these points have been cleared up, there are one or two suspiciously good reputations which might bear a second look. But let us rescue the rascals from the scrapheap of history first—From *The World Veteran*, December, 1955. (Industrial medicine's contribution to the category of those rehabilitated after death probably gives first place to Paracelsus—one Philip Theophrastus Bombastus von Hohenheim. Paracelsus long bore the stigma of being medicine's all-time, most notorious quack. In late years, through rehabilitation, he has emerged as one of the best medical minds of remoter centuries—the break-off of the shackles of Galenic medicine and, in a measure, the true father of industrial medicine, antedating Ramazzini, as he did by nearly two centuries.)

1956 Physician's Award

Gradie R. Rowntree, M.D.

GRADIE R. ROWNTREE, M.D., Medical Director, Fawcett-Dearing Printing Company, Louisville, Kentucky, on January 23, at Detroit, received the 1956 Physician's Award, given annually by the President's Committee on Employment of the Physically Handicapped, for "an outstanding contribution to the welfare and employment of the Nation's physically handicapped men and women." The Physician's Award, an illuminated scroll on a mahogany base, is signed by the President of the United States. It is presented each year to a physician who has been active in the field of industrial medicine and who has been instrumental in improving job opportunity for the physically impaired. The recipient is chosen out of scores of nominations from all parts of the country. Last year's winner was Harold A. Vonachen, M.D., Medical Director, Caterpillar Tractor Company, Peoria, Illinois. Other previous winners have been Henry H. Kessler, M.D., Medical Director, Kessler Institute for Rehabilitation, West Orange, New Jersey, and Frank H. Krusen, M.D., Mayo Clinic, Rochester, Minnesota.



"Kind hearts are more than coronets"

The presentation of the Award was made in behalf of President Eisenhower by Major General Melvin J. Maas, USMCR, Ret., Chairman of the President's Committee on Employment of the Physically Handicapped. The occasion was the Annual Dinner, at the Sixteenth Annual Congress on Industrial Health at the Sheraton-Cadillac Hotel. "Dr. Rowntree was chosen," General Maas said, "for his lifelong association with the field of rehabilitation and employment of the physically impaired. He has served as a medical teacher, industrial physician, community leader, and medical consultant, and his efforts have been centered on the actual rehabilitation of the handicapped individual or assessment of his capabilities and with a constant effort to promote the idea that there is a definite place for the handicapped in industry."

In addition to being Medical Director at Fawcett-Dearing, Dr. Rowntree is Professor and Chief of the Section on Industrial Medicine, University of Louisville School of Medicine; Vice-Chairman, Louisville-Jefferson County Board of Health; Chairman, Kentucky Alcoholic Study Commission; Chairman, Kentucky State Medical Association Committee on Industrial Medicine and Surgery; Former Chairman, Industrial Committee, Louisville Heart Association; Medical Consultant, Louisville-Jefferson County Rehabilitation Center; and Member of the Kentucky Governor's Committee for Employment of the Physically Handicapped. As Chairman of the Kentucky State Medical Association Committee on Industrial Medicine and Surgery, he has fostered the theme of employment of the physically handicapped among the physicians of Kentucky. In this capacity he was instrumental in bringing the 1954 Annual Congress on Industrial Health to Louisville. He is a member of the Louisville-Jefferson County Board of Health, which helped in the establishment of the Rehabilitation Center at Louisville.

WILLIAM P. SHEPARD, M.D., AMA Council Chairman, was Master of Ceremonies at the Congress Dinner. In introducing General Maas, he described the General as "totally blind for four years, and suffering from diabetes and arthritis." The vigor and earnestness with which the General spoke, his poise, and the dignity of his demeanor seemed almost to contravene these facts. Dr. Shepard had somewhat prepared his listeners: "This man is a United States Marine." But over and above that, the impact of the General's presence made a deep and lasting impression.

During the past year General Maas traveled some 100,000 miles in the Committee's work to get jobs for the handicapped and "restore to them their dignity." Overseas, the General said he discovered that the work of the Committee was an impressive argument against communism—much more appealing "than communist promises of autos, roads, or even hospitals."

Sixteenth Congress on Industrial Health

January 23-24, 1956, Detroit

THE SIXTEENTH Annual Congress on Industrial Health was held at Sheraton-Cadillac Hotel, Detroit, Monday and Tuesday, January 23 and 24, 1956. The sponsors were the AMA Council on Industrial Health; Wayne County Medical Society; Michigan State Medical Society; Detroit Society for Surgery of Trauma; Michigan Industrial Medical Association; Detroit Industrial Physicians' Club.

The Monday morning subject was "Occupational Medicine in Industrial Relations." Norbert J. Roberts, M.D., Associate Medical Director, Standard Oil Company (New Jersey), the first speaker, said that the individual's attitude toward the Medical Department may be much influenced by his feeling toward the company, and the reverse is also true. Management thus has a good chance, within the framework of the Medical Department, to show its personal interest in the individual and his problems.

Katherine A. Lembright, R.N., Assistant Executive Secretary, American Nurses Association, speaking from the standpoint of the nurse, said that the nurse is in an unusually advantageous position to improve industrial relations and to be a buffer between the employee and management.

Charles B. Gorey, Jr., Director of Forward Planning and Assistant to the Vice-President and Operating Manager, Chrysler Corporation, said that the industrial Medical Department must never give the employee the idea that it is "against him and for the company." Cooperation between the plant physician and the private practitioners is important; the personal interest of the industrial physician in the employee is especially needed when the employee returns after an absence.

Representing labor and employees on this panel were David A. Wolff, Chairman of the Appeal Board, Chrysler Corporation, and Harry Read, Assistant to the Secretary-Treasurer, AFL-CIO, Washington.

The Monday afternoon topic was "Medicine's Responsibilities in the Automotive Age." The feature of this session was the talk by AMA President, Elmer Hess. Dr. Hess suggested several steps toward reducing the "sordid" highway accident toll, including tougher driver license requirements with interstate standardization, stricter law enforcement, standardized safety improvements in automobiles, and a national research institute on safe driving. While complimenting the auto industry on its recent efforts to add safety features, Dr. Hess criticized its emphasis on power and "sizzling take-off." He said the industry should "make itself responsible for producing machines which do not tempt men to make fools of themselves." He also said safety features should be standardized within the industry.

Paul H. Blaisdell, Director, Traffic Safety Division, Association of Casualty and Surety Insurance Companies, New York, speaking on safe driving, suggested that 50 cents be added to the cost of every driver's license or renewal, to produce about $35 million in the next four years—the money to be used to support research on driver testing, preferably under AMA administration. The governors' conference, national associations of state officials, and safety groups everywhere should be responsible for the public education needed to make the plan possible. The 50-cent fee would not be a permanent tax but a limited special assessment. He gave two major points of advice on the "chaos" of the present driver license situation: "don't blame the public officials charged with legal responsibility for driver licensing for the conditions which exist today. Most of them inherited the mess from one or more predecessors in office. Second, face frankly the truth of what has happened in the viewpoint of the American people toward the motor vehicle and toward that small piece of paper which attests the legal privilege of operating that vehicle . . . . Too many of our drivers have lost sight of the privilege concept and regard the driver license as an inalienable right guaranteed to a free-born American under the Constitution and the Bill of Rights." Outlining a dozen points where states differ in driver license requirements, Mr. Blaisdell listed three items found to be a median for performance in states with the best highway safety records: 12 days of specialized training for driver license examiners, 15% failure of applicants on their first driver license examinations, and 90 suspensions and/or revocations of the license for every 10,000 licensed drivers.

Seward E. Miller, M.D., Chief, Division of Special Health Services, U.S.P.H.S., also stressed the need for educating the public to the fact that driving is a privilege, not a right. He outlined recent discussions of driving licensing at a World Health Organization meeting in Geneva, where participants pointed out a need for developing mental and physical standards for drivers. The WHO committee also said it considered private physicians responsible for acquainting themselves with physical and mental standards for drivers, and adopted two sets of interim standards, one for private drivers and a more rigorous one for drivers of heavy trucks and buses.

William P. Shepard, M.D., Chairman, Council on Industrial Health, was master of ceremonies at the Annual Dinner Monday evening. A feature of the dinner was the address by Benson Ford, Vice-President and Group Director, Ford Motor Company. Mr. Ford disagreed with Dr. Hess on several points. He said he felt the development of safety equipment would advance more rapidly if kept highly competitive, so that industries would vie with each other to produce the safest cars. He also defended the industry's efforts to increase horsepower. The growth of power has not been matched by an increase in top speed, and horsepower is itself a safety feature since it allows faster action in escaping hazardous situations. Outlining a number of safety devices now standard in most cars, Mr. Ford said the industry has been going slowly on several proposed features because there is not enough evi-

dence that they actually would be effective. He said that "unfortunately, there is a shortage of the cold scientific evaluation and fact finding that we need in order to progress as fast as we should like in reducing the injury potential of the automobile interior." Noting that the medical profession has recently entered more actively into cooperation on accident prevention fact-finding, such as the Cornell University research, Mr. Ford urged that doctors devote even more attention to these efforts. He said the medical profession in the past has been "a sort of hair shirt" to the automotive industry on safety design, and the industry has sometimes "smarted under unjust criticism." He said the industry has accepted this because it is "just as interested in automotive safety as doctors are." Describing a number of safety features now being tested, he said that since "the driver himself is the key to safe driving," engineers are trying to make the automobile as nearly immune to human failure as possible.

Detailed discussions of driver safety and auto design research were given by Ross A. McFarland, Ph. D., Associate Professor of Industrial Hygiene, Harvard School of Public Health; and John O. Moore, Director of Auto-Crash Injury Research, Cornell University Medical College. Dr. Jacob Kulowski, St. Joseph, Missouri, Committee on Medical Aspects of Automobile Injuries and Deaths, AMA, discussed the physician's responsibility before and after auto accidents.

THE SESSIONS on Tuesday were devoted to "Absence From Work Due to Non-Occupational Illness and Injury." One of the items discussed was a new syllabus on work absence which was made available to all participants. Written by Mark S. Blumberg, M.D., and James Coffin, A. B., under the direction of the U.S.P.H.S. occupational health program, the syllabus is intended as a basic reference.

Lemuel C. McGee, M.D., Medical Director, Hercules Powder company, Wilmington, Delaware, cited the first line of the syllabus as support for the theory that there are many categories of unpreventable absence: "A worker on the job must be both willing and able to be there; if one of these conditions is not satisfied, he will be absent." He said medicine may have placed too much stress on "willingness to work" because of "its chagrin at not being able to prevent such absence-causing disabilities as the common cold." However, he pointed out that absence may be elective or constructive (such as for surgical correction of defects, or for prevention of contagion), while many fluctuations in absence rates may be due to other non-occupational-illness causes. For instance, during high prosperity periods when jobs are abundant, absence increases.

Frederick Slobe, M.D., Chicago, Blue Cross-Blue Shield Medical Director, emphasized that control of absence is not the sole purpose of the industrial Medical Department. This is largely an administrative problem, he said, and the department should not be a "policing agency" for work absence due to nonorganic causes. The department should, however, serve as adviser and counselor on this problem. Dr. Slobe pointed out a recurring theme of the discussion—the importance of referral to private physicians, and of liaison with them. He then described the "typical industrial absentee" on the basis of information in the syllabus: The absentee is married, female, on the third shift, between 26 and 35 years old, in a large city and a large firm with broad benefit plans, is low on the wage scale, has little responsibility and little liking for her work, and her absence occurs on the day after a holiday in a period of high prosperity.

Jerome Pollack, UAW Social Security Department, said such things as income guarantees will help stabilize employment, and "labor will discount any pronouncement deploring unnecessary worker absence unless the same concern is demonstrated for avoiding unnecessary layoffs." Generally, health insurance plans still have "immaturities and deficiencies," Pollack said. One of the most important is that they do little to prevent disability, since diagnostic care is specifically excluded from coverage. Thus, at the very time when occupational health programs are actively seeking to encourage as many employees as possible to come for screening and diagnostic examinations, the prepayment plans are occupied with measures to keep them away, he said. "One of the penalties of overspecialization, to which advanced managements are especially vulnerable, is that the industrial Medical Department—which may be imbued with the preventive approach—is often not consulted in company decisions on the general hospital-medical programs . . . . To attempt to prevent most injuries and diseases requires an attack dealing with the total environment. Here union cooperation is imperative, and both management and labor must turn to community efforts. For the greatest gains in overcoming disability absence, labor is counting on expanded programs of preventive care, early and accurate diagnosis, effective treatment of disease, and the further development of rehabilitation in the conquest of severe disability."

Pioneering by the Ontario Department of Health in absenteeism record-keeping was outlined by R. B. Sutherland, M.D., Toronto, of the department. He described an eight-year study in which 16 firms cooperated in keeping a punched-card system of three types, gauged to fit various industries. The information is being amassed in search of factual background on reasons for industrial absence.

ONE FACT which should be stressed is that older workers are not the major contributors to absence they have been believed to be, according to A. Hazen Price, M.D., University of Michigan Professor, and consultant to several large corporations. However, Dr. Price said older workers need to be eased into retirement and helped in their adjustments, as a major preventive against chronic disability. Yearly evaluation of individuals is needed, to stave off the physical and mental deterioration which results when the older worker faces a fixed retirement date.

Mental and emotional problems were flatly named as greater causes of absence than any occupational disease or accident, by Frank A. Calderone, M.D. Dr. Calderone said true reduction in total absenteeism will occur when management, labor and industrial medicine allow the industrial medical service to do its proper job of prevention and counseling, thus enabling it to help the worker achieve and maintain the highest level of emotional and physical well being.

Among others on the program were Milton A. Darling, M.D., President of the Wayne County Medical Society; William S. Jones, M.D., President, Michigan State Medical Society; William A. Sawyer, M.D., Chairman of the AMA Committee on Medical Care for Industrial Workers; Melvin N. Newquist, M.D., Medical Director, the Texas Company, New York City; and Franklin M. Kreml, Director, Transportation Center, Northwestern University.

Industrial Medical Association

President's Page

THE Industrial Health Conference will convene this April in Philadelphia for the first time since 1935 and for the fourth time in the history of the Industrial Medical Association. Just as in the past, this meeting is being sponsored by the organizations representing the medical and professional members of the industrial health team—the Industrial Medical Association, the American Industrial Hygiene Association, the American Conference of Governmental Industrial Hygienists, the American Association of Industrial Nurses, and the American Association of Industrial Dentists. This will be the Forty-First Annual Meeting of the Industrial Medical Association.

The Conference Chairman and his co-workers have done an outstanding job this year, as is reflected by the preliminary program distributed through the mail a short time ago. Registration will begin Monday morning, April 23. Advance registration can be made now. Although well over 2,000 rooms have been provided for, this year's attendance promises to be the largest our Conference has ever experienced. Better not delay requests for accommodations.

THE Annual Business meeting of the Association will begin promptly at 4:00 o'clock Wednesday afternoon, April 25. There, the membership will elect its officers for the ensuing year. The Nominating Committee has already prepared the ballot, and it was officially sanctioned by the Board of Directors at the January meeting. The portrait and some information about each candidate appear elsewhere in this issue. As usual, there are two groups. One consists of the Executive Committee's nominations for President-Elect, First Vice-President, Second Vice-President, Secretary, and Treasurer. (Dr. "Jack" Jones, now President-Elect, automatically becomes President.) The other comprises 12 nominees, six of whom are elected to the Board of Directors for a two-year term, replacing six outgoing Directors. The ballot has been prepared ahead of time so as to give opportunity for study and consideration.

In addition to the fine scientific program, there will be a number of unusually good and informative scientific exhibits this year. The "grapevine" has indicated that Dr. Kern Linder's Entertainment Committee has already completed a fabulous program for the ladies. It is rumored, too, that the "light and merriment" portion of our Annual Banquet will be something to be remembered for years to come.

Kieffer Davis, M.D.

Industrial Medical Association

Nominees

THE BOARD of Directors of the INDUSTRIAL MEDICAL ASSOCIATION, as provided in the By-Laws, have nominated one candidate for each of the offices of President-Elect, First Vice-President, Second Vice-President, Secretary, and Treasurer. The present President-Elect, E. S. JONES, M.D., will automatically succeed to the office of President at the conclusion of the Annual Meeting in April at Philadelphia. At the Annual Business Meeting, April 25, the following nominees, whose pictures appear on the next page, will be voted upon: JEROME W. SHILLING, M.D., for President-Elect; H. W. LAWRENCE, M.D., for First Vice-President; D. JOHN LAUER, M.D., for Second Vice-President; H. GLENN GARDINER, M.D., for Secretary; EDWARD C. HOLMBLAD, M.D., for Treasurer.

As further provided by the By-Laws, the Nominating Committee has reported two candidates for each of the vacancies on the Board of Directors for the years 1956-58. Six Directors are to be elected for this term. The pictures of the 12 nominees appear on page 146. These candidates will be named on the prepared ballot; however, further nominations may be made from the floor and may be written on the ballot.

All of the men nominated have demonstrated their interest in the INDUSTRIAL MEDICAL ASSOCIATION and also their willingness to work to promote the cause of the Association. There is good geographical distribution, and representation from the component groups.

Biographies

HERE are brief biographical notes on each of the nominees for IMA Directorships:

ALLEN M. COLLINSWORTH, Consultant in industrial and traumatic surgery, Atlanta, Georgia; M.D., University of Georgia, 1928; IMA Member, 1937, Fellow, 1952; IMA Counselor, District 7; Consultant, Occupational Health Institute, District 7; Committee on Industrial Health, Medical Association of Georgia.

L. E. CURTIS, Chief, Medical Department, Standard Oil Company of California, San Francisco; M.D., State University of Iowa, 1928; IMA Member, 1949, Fellow, 1955; Director, Western IMA; Member, API Medical Advisory Committee, 1948, Chairman, 1956.

CARL U. DERNEHL, Assistant Medical Director, Union Carbide and Carbon Corporation, New York City; M.D., University of Wisconsin, 1938; IMA Member, 1947, Fellow, 1952; former IMA District Counselor; Chairman, IMA Membership Committee.

HOMER S. ELMQUIST, associated with Ben Frees and Staff, Los Angeles, and Consultant for Goodyear Tire and Rubber Company, Sears Roebuck, Armour, Chrysler Motors, Hughes Aircraft, Cadillac Division of General Motors, and other companies; M.D., State University of Iowa, 1930; IMA Member, 1947, Fellow, 1955; Director, Western IMA, 1950-52, Vice-President, 1953-54, President, 1954-55, Chairman, Board of Directors, 1955-56.

WALTER E. FLEISCHER, Medical Director, Baltimore Works, Armco Steel Corporation, Baltimore, Maryland; M.D., Cornell University, 1937; IMA Member, 1944, Fellow, 1952; IMA Counselor, District 5; Regional Consultant, Occupational Health Institute.

EMMETT B. LAMB, Medical Director, P.R. Mallory & Company, Inc., Indianapolis, and Physician in Charge, Indianapolis Works, International Harvester Company; M.D., Indiana University, 1931; IMA Member, 1942, Fellow, 1947; IMA Counselor, District 15; President, Central States Society of Industrial Medicine and Surgery, 1950; Fellow, American College of Surgeons; Fellow, International College of Surgeons.

C. SCOTT MCKINLEY, Medical Director, Bakelite Corporation, Bound Brook, New Jersey; M.D., University of Pennsylvania, 1938; IMA Member, 1941, Fellow, 1948; President, Industrial Medical Association of New Jersey, 1950.

CARL A. NAU, Professor and Chairman, Preventive Medicine and Public Health, University of Texas Medical Branch, Galveston; M.D., Rush Medical College, 1933; IMA Member, 1943, Fellow, 1948; Fellow, American Public Health Association.

GRADIE R. ROWNTREE, Medical Director, Fawcett-Dearing Printing Company, Louisville; M.D., University of Arkansas, 1932; IMA Member, 1948, Fellow, 1952; IMA Director, 1952-54; IMA Counselor, District 13.

JAMES I. ROBERTS, Medical Director, New England Power Service Company, Boston, and Consulting Physician for affiliated and associated Public Utilities in New England; M.D., Tufts College, 1932; IMA Member, 1939, Fellow, 1942; IMA Counselor, District 1.

THOMAS L. SHIPMAN, Health Division Leader, Los Alamos Scientific Laboratory, Los Alamos, New Mexico; M.D., Harvard University, 1932; IMA Member, 1940, Fellow, 1943; Director, American Industrial Hygiene Association, 1950-52.

ROBERT M. WATROUS, Plant Physician, Abbott Laboratories, North Chicago, Illinois; M.D., Northwestern University, 1936; IMA Member, 1941, Fellow, 1952; Chairman, IMA Committee on Toxicology, 1941-54; Chairman, Section on Toxicology, IMA Annual Meeting, 1951; Fellow, American Academy of Occupational Medicine, 1954.

Western Association

WESTERN INDUSTRIAL MEDICAL ASSOCIATION'S program for its Fifteenth Annual Meeting, April 28, 1956, at the Ambassador Hotel in Los Angeles, includes the following:

RUTHERFORD T. JOHNSTONE, M.D., will report on the "Status of Certification."

ALBERT A. MARINACCI, M.D.—outstanding in the Los Angeles area for his work—will discuss "The Electromyogram and its Use in Industrial Medicine."

MOSES A. GREENFIELD, Ph.D., Associate Professor of Radiology, U.C.L.A., will talk on "What the Industrial Physician Should Know About the Use and Possible Hazards From Nuclear Reactors and Multicurie Sources."

T. J. HALEY, Ph.D., Associate Clinical Professor of Medicine (Industrial Toxicology), U.C.L.A., will urge: "Don't Blame Industry for Household Poisonings."

The last subject in the morning will be "Is There Lack of Cooperation Between the Industrial Physician and the Industrial Nurse?"—the speaker to be named by the Western Industrial Nurses Association.

The afternoon session will feature an address by WILLIAM P. SHEPARD, M.D., Second Vice-President,

Industrial Medical Association

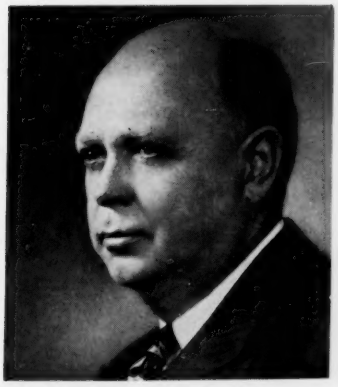
E. S. Jones, M.D.
Lever Brothers, etc.
To become IMA President

Jerome W. Shilling, M.D.
Pacific Telephone & Telegraph Company
Nominee for IMA President-Elect

H. W. Lawrence, M.D.
Procter & Gamble
Nominee for IMA First Vice-President

D. John Lauer, M.D.
Jones & Laughlin Steel Company
Nominee for IMA Second Vice-President

H. Glenn Gardiner, M.D.
Inland Steel Company
Nominee for IMA Secretary



Edward C. Holmblad, M.D.
Nominee for Treasurer
Industrial Medical Association

Industrial Medical Association

Nominees for the Board of Directors, 1956-1958 (Six to be elected)

Allen M. Collinsworth, M.D.

L. E. Curtis, M.D.

Carl U. Dernehl, M.D.

Homer S. Elmquist, M.D.

Walter E. Fleischer, M.D.

Emmett B. Lamb, M.D.

C. Scott McKinley, M.D.

Carl A. Nau, M.D.

Gradie R. Rowntree, M.D.

James I. Roberts, M.D.

Thomas L. Shipman, M.D.

Robert M. Watrous, M.D.

Health and Welfare, Metropolitan Life Insurance Company, who will speak on "The Practice of Medicine in an Industrial Society." His theme will be along the lines of "there has been a sociological revolution going on in this country (especially in the West) due to the migration of many millions of people from rural to urban areas to take advantage of high wages and readily available jobs in industry; this is added to by the movement of industry to semi-rural areas where small branch plants are being erected to employ rural people on a seasonal or part-time basis; industrial employment together with the amazing increase in the purchase of prepaid medical plans has greatly modified the practice of medicine; it is encumbent on medicine to be aware of these changes and to be alert to their challenges, opportunities, and hazards." This will be followed by a paper entitled "What is the Place of the Medical School in Occupational Medicine in Respect to Teaching, Research and Service?"—presented by STAFFORD L. WARREN, M.D., Dean, U.C.L.A., School of Medicine. The third subject of the afternoon, "Preliminary Report on a New Method of Measuring Liver and Kidney Damage by the Use of Radioisotopes," will be presented by GEORGE V. TAPLIN, M.D., Associate Clinical Professor Medicine, U.C.L.A. The session will close with a "Workmen's Compensation Clinic Hour." This in some respects is a modification of the usual afternoon panel which has been presented in past years on medicolegal problems and compensation insurance. Instead of a formal panel program, there will be four or five representatives from the various institutions involved in this type of work. The program will be followed by the election of officers.

American Academy

THE AMERICAN ACADEMY OF OCCUPATIONAL MEDICINE held its Eighth Annual Meeting at the Netherland Plaza Hotel, Cincinnati, February 15-17, 1956. Physician faculty members, University of Cincinnati College of Medicine presented the following papers: "The Skin"—RAYMOND R. SUSKIND, M.D.; "Respiratory System"—VIRGIL A. PLESSINGER, M.D.; "Circulatory System"—ARNOLD IGLAUER, M.D.; Hemopoietic System"—KARL V. KITZMILLER, M.D.; "Liver and Gastro-intestinal System"—STUART A. SAFDI, M.D.; "Genitourinary System"—JOHN W. HAUSER, M.D.; "Central Nervous System"—JOHN CAMPBELL, M.D.; "Man as a Whole"—W. DONALD ROSS, M.D.; "Private and University Laboratories"—ROBERT A. KEHOE, M.D.; "Early Treatment of Hand Injuries"—VINTON E. SILER, M.D.; "Diagnosis and Treatment of Back Pain: Evaluation of Ability to Work"—ROBERT PERLMAN, M.D. Thursday morning, DR. MITCHELL R. ZAVON, Director of the Bureau of Industrial Health, Cincinnati Health Department, discussed local agencies; DR. THOMAS F. MANCUSO, Columbus, Ohio, Chief, Division of Industrial Hygiene, State of Ohio Department of Health, talked on the State Department of Health; and DR. W. CLARK COOPER, Chief, Occupational Health Field Headquarters, Cincinnati, considered the United States Public Health Service. In observation of its Tenth Anniversary, the Academy presented the first GEORGE H. GEHRMANN Lecture in the ballroom of the Cincinnati Club Thursday evening. MR. EMILE F. DU PONT, Director, E. I. du Pont de Nemours and Company, Wilmington, Delaware, was the speaker. Friday morning "Economic Aspects of Industrial Medical Programs" was presented by DR. MARK S. BLUMBERG, Occupational Health Program, Division of Special Health Services, U.S. Public Health Service, Washington, D.C.; "The Treatment of Methemoglobinemia" by ARTHUR F. MANGELSDORFF, M.D., American Cyanamid Company, Bound Brook, New Jersey; and "Clinical Effects Associated with Heliarc Welding" by MORRIS KLEINFELD, M.D., Brooklyn, Assistant Director, Division of Industrial Hygiene, New York State Department of Labor . . . . The following is from the GEORGE H. GEHRMANN Lecture by MR. DU PONT: "Undoubtedly some critics of American industry will argue that management was acting in self-interest because some states had started to enact workmen's compensation laws. Others may contend that management and owners realized that good health within a company is financially rewarding. Undoubtedly both factors had some influence. Let me quote, however, from the minutes of the Du Pont Company's Executive Committee for October 18, 1915. MR. IRENEE DU PONT, then Chairman of the Committee and now Honorary Chairman of the Board of Directors, made the following recommendation: 'It is suggested that it would be well to have the principal employees of the company examined by competent doctors, with the object of discovering organic troubles or disease, where such may exist, in order that remedy may be applied thereto before the trouble made itself apparent without such precautionary examination . . . . It would seem inadvisable to make such examinations compulsory as that might seem objectionable to a small percentage of the men. Probably if examinations were offered without charge to the employees the great majority would avail themselves of the opportunity, for it would confer a benefit on the men themselves.' "

Nursing Service Objectives

IN REPLY to the demands for a statement on the Objectives of an Industrial Nursing Service, the Committee on Professional Standards of the American Association of Industrial Nurses developed the following statement which was approved by the AAIN Board of Directors in September, 1955: "OBJECTIVES OF AN INDUSTRIAL NURSING SERVICE: The industrial nursing service should be administered and staffed by registered professional nurses. Industries and companies vary widely—so do the policies governing the types and amounts of professional nursing service to be provided and the administrative methods of supplying service. The objectives are the same for all nursing services. Varying conditions may limit or modify the practical goal of achievement. The major objective of any industrial nursing service is to provide a nursing program for employees which will help them maintain the highest potential level of health and efficiency. Contributory objectives are: to give competent nursing care and treatment; to obtain medical direction where none exists; to adapt the nursing program to serve the health needs of the company with respect to its character, size, and location; to have and maintain adequate space, equipment and supplies; to have and use an adequate record system; to maintain good working relations with all departments of the company; to maintain cooperative relations with local physicians and health and other community agencies; to maintain good relations with the general public; to upgrade the quality of the nursing service through continual personal and professional growth; to evaluate the nursing program periodically and revise it to meet changing needs."

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Books

Health Perplexities in Aviation

COLLECTED PAPERS ON AVIATION MEDICINE: Published for Advisory Group for Aeronautical Research and Development, North Atlantic Treaty Organization. Interscience Publishers, Inc., New York, 1955, pp. 209, $5.00.

This collection of papers is no elemental series intended for the novitiate in aviation medicine. Except for those versed in this kind of medicine, one function well served by this book is to demonstrate what a distinct specialty aviation medicine has become—in good measure justifying aviation medicine's specialty board status, although manifestly aviation medicine is but one division of occupational medicine. This publication represents a series of 18 papers presented at the Aeromedical Panel Meetings on Aeronautical Research and Development in Paris. Four of the papers are in the French language.

The flavor of this volume's content is reflected through mention of selected essay titles: "Arctic Survival Problems"; "Physiological Requirements of Pressure Cabins"; "Consequences of Loss of Cabin Pressure"; "The Nature of Cold-Induced Tissue Injury"; "The High Intensity Noise Problem in the U. S. Navy"; "Tolerance to Abrupt Deceleration"; "Night Vision"; "Practical Aspects of Heterophoria in Aviation."

This book is a striking demonstration of the occupational health perplexities that attend aviation and more particularly the pilots of aircraft.

Both Lose

ABSENTEEISM: Research Council for Economic Security, Chicago. 1955, pp. 87, $3.50, paper covered.

Absenteeism, always vexatious to industry, possibly is more than ever disconcerting. This is reflected not only throughout this publication but in the fact that close to the time of publication of this review, the AMA's Congress on Industrial Health is devoting an extensive portion of its program to this evil.

It becomes manifest that as to causes, absenteeism is not an entity but a complexity. High wages and general prosperity foster a willingness on the part of workers to indulge in repeated absenteeism, in no wise related to illness. The widening gap between management and labor has destroyed much of that fine old attitude of "work faithfulness." In the midst of justifiable condemnation of absenteeism, it is possibly true that a little planned absenteeism is laudable or at least condonable.

This present study reports a seminar on absenteeism which in turn was based upon the Research Council for Economic Security's concise study of prolonged illness absenteeism. In addition to those contributions directly concerned with the control and prevention of illness absence, other sections helpfully are directed to the identification and measurement of absenteeism and the evaluation of absentee records, and embrace benefit plans in general and as they relate to absenteeism. Some indication of the significance of this report, and solely in relation to prolonged illness absenteeism, is revealed in this language: "Purely for purpose of illustration we might use the simple round figure of 40 million employed persons and a low estimate of three absences of more than four weeks duration per 100 employees per year. At that rate there are some 1,200,000 prolonged absences each year. The average absence is about 10 weeks. We are, thus, experiencing a loss of 240,000 man years, valued at approximately one billion dollars. The direct cost to the employees also is considerable. The data to date indicate an average net medical-care cost of $150 per prolonged absence, suggesting a total bill of $180 million per year. This is the direct net cost to the workers remaining after the receipt of all benefits under hospitalization, surgical and medical-care insurance and other prepaid plans. In addition, the net wage or income lost, over and above sickness compensation and sick-leave allowances, is perhaps $500 million."

Through no magic does this Council stand forth with ready answers to all the dilemmas of absenteeism. The contribution made, and it is substantial, is in further disclosure of the enormous costs involved in absenteeism from any cause and that these losses bear down upon the worker himself as well as upon his employer.

Philosophy and Problems

MEDICAL RESEARCH—A Midcentury Survey (Volumes I and II): The American Foundation. Little, Brown and Company, Boston, 1955, total pp. 1505, 2 volumes, $15.00.

Volume I is entitled: American Medical Research in principle and practice; Volume II is entitled: Unsolved Clinical Problems in biological perspective. These two volumes, although not so specified, are for medical statemen, and these medical statesmen are not limited to those who possess the M. D. degree. Five years after the turn of the half-century, this appraisal is made of the status of medical research. By no means is this work directed to the technical details of any one or any several specific situations. Rather, it is concerned with the philosophy of scientific medical research—the loci of such activities; the source of finances for medical research; the function of government in relation to medical research; the role of private foundations. Exploration of these titles has produced an array of significant revealment, one point being that much present-day medical research is hampered by inadequate funds, costs having increased to an astonishing degree.

The second volume is devoted to a series of obviously unsolved medical matters but these are presented only as examples of how much remains to be done. Emphasis is directed to cancer, infertility, arteriosclerosis, hypertension, the rheumatic syndromes, tuberculosis, the viruses, alcoholism, and schizophrenia. Any medical reader, without complaint about this second volume's content, readily might multiply that list of 10 perplexities severalfold. Many at once would urge that functional disorders of the brain, manifest in minor quirks and crotchets, in the aggregate stagger all medical facilities.

These two books bring gratification that so much has been accomplished and is under way in medicine, but they also stir humiliation that so much has been left without fruitful returns.

INDUSTRIAL MEDICINE AND SURGERY

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Volume 25 MARCH, 1956 *Number 3*

Occupational Health's Most Compelling Words

ANY WORDS graven in stone for all time above the door of a fine edifice must be cogent. Few and potent, they will be no trite slogan, no mere epigram. They must tell an entire story, must have appeal for all, must be persuasive. One great industrial plant devoted to progress through research has over its entrance Lord Kelvin's: "I have found a better way." That is the saga of determined progress. Elsewhere, above a noble university building for instruction in law are found these words, "Thou shall teach them the law." That is an entity, but sharper terseness to the same end resides in the Biblical proverb, "Law is Light." Carved into the seal of the American Public Health Association, under a depicted tree of life, is this expression: "And the Leaves of the Tree were for the Healing of the Nations." A stated purpose is complete.

What few words chiseled for the ages above the portal of an occupational health building appropriately might tell the wonders, or even the objectives, of health in industry? That is no idle contemplation. A gigantic industry, now planning a substantial edifice for medical services to its worker associates, proposes to have carved not above the entrance but upon its interior walls, a number of forceful lines. What shall they be? This Journal has been asked to contribute from its maturity. Being fallible, yet captivated by the possibilities, the Journal passes this appeal to the wisdom of its readers. What words in occupational health are most convincing, potent, appealing, cogent, expository? They may not extoll the physician; he is but an instrument in healing and fending. They may not laud the employer; he, indeed, is the provider but likewise a beneficiary. The arrow must point to the worker.

A few suggestions come to mind:

"Add life to years; add years to life."

"Work is the cure for many ills."

"Disease need not always be a near neighbor."

"Life is not merely being alive, but being well."

"He who has health is young."

"Health is the first of all liberties."

"Occupational health has doubled the span of work years."

"Spare the hearty son for the waiting arms of his mother."

"The worker is the first beneficiary of all occupational health."

"Nothing in medicine is valuable unless applied to those who need it."

There *must* be more sagacious words.

Your suggestions are awaited.

Time for Protest

PRAISE without "buts" has been earned by the National Fund for Medical Education for the procurement and distribution during 1955 of substantial sums of money supplementing the meager resources of medical schools. "Grants amounting to $2,657,433.90 were awarded to the nation's 81 medical schools . . . . Fifty-eight percent was contributed by corporations, through the Fund's Committee of American Industry, and the balance by physicians, through the American Medical Education Foundation. This is the largest annual award in the Fund's history—22% greater than in 1954—and brings to $9,589,490.03 the total awarded by the Fund since 1951, the year in which the first grants were awarded . . . . Fund grants are unrestricted except for the provision that they cannot be used for building purposes.

The money is used by the schools primarily to hold their teachers, fill faculty vacancies, and open new courses in areas of recent scientific progress . . . . Industry's support of medical education has mounted steadily since 1949, when the Fund was set up. Last year 1,532 corporations contributed to the Fund, compared with 1,129 in 1954."

However, praise only with "buts'" is deserved by the Fund for its reporting, in its own periodical *Medical Advance*, of its sponsored Conference on the Education of Physicians for Industry conducted in Pittsburgh last December. Whenever any zealous agency seeks the forward-putting of its best foot, a proneness may appear to depict that which it seeks to control, or reform, or overthrow, as something frightful. It is well-known that, in Washington, as military budget time comes around, that is the very moment when, by some strange coincidence, Russian submarines may be found to be prowling up and down the Atlantic or Pacific coasts. By some that might be termed "salesmanship."

The Pittsburgh Conference exercised its rowels—spurring alertness among physicians and industrialists alike to support for medical education—but in so doing it paraded a monstrous and distorted picture of industrial medicine. Maybe that's salesmanship to gain a desideratum. Yet the belaboured victim scarcely may be expected to lead any cheering. Few conferences may be chided for distressing remarks by some uncensored program participant. Tolerance takes care of that. However, the Fund's own organ *Medical Advance* perpetuates and emphasizes the offensive. This paragraph is found:*

"The problem of education in occupational health is complicated by the fact that industrial medicine is new (it won recognition as a specialty only about a year ago) and therefore (1) the body of knowledge in the field is sparse, (2) few courses on industrial medical subjects are available, and (3) the opportunities for industrial physicians are so far pretty limited."

The next paragraph in the *Medical Advance* report begins with these words: "most so-called industrial practice in this country . . . . is still part-time, conducted chiefly by general practitioners . . . . "

THE TIME for protest has arrived. None of the four claims above quoted is finally true. The truth lies in the facts, as follows:

The Claim: "Industrial medicine is new (it won recognition as a specialty only about a year ago)."

The Facts: "Only about a year ago" industrial medicine was accorded specialty board status. Now its qualified specialists may be awarded certification. Far earlier, industrial medicine was accepted as a medical specialty by the American Medical Association, as exhibited by inclusion in the specialty listing of the AMA Physicians' Directory as "Industrial Practice." The AMA Directory, unlike *Medical Advance*, did not use the amazing term "so-called industrial practice." Other specialists such as the dermatologist or pediatrist medically served in a specialty and were accepted as specialists long before specialty boards and diplomates were heard of. Actually industrial medicine reached a specialty status as one product of World War I. Less factually, Ramazzini specialized in occupational diseases in the sixteen-hundreds when much of surgery was promoted through the striped poles of the barbers.

The Claim: "the body of knowledge in the field is sparse . . . . "

The Facts: What distinguishes industrial medicine as a specialty, apart from medicine in general and other specialties, is the knowledge that industry must have of industry itself. Industry's body of knowledge becomes just a part of the knowledge of the industrial physician. The Chairman of the Pittsburgh Conference stated on a later occasion that, at the present time, no 16-volume system of publications could encompass the strictly medical data that have developed in the occupational health field. The field of knowledge for industrial medicine is larger than for any other specialty; the "body of knowledge" (industrial-medical knowledge) already accumulated in the field is many times the complete opposite of "sparse."

The Claim: "few courses on industrial medical subjects are available . . . . "

The Facts: Eight medical or public health schools now conduct training activities at the postgraduate level, some awarding special degrees designed for the field. The difficulty is not as to training facilities but resides in too few students. Oftentimes the faculty number exceeds the number of candidates.

The Claim: "the opportunities for industrial physicians are so far pretty limited."

The Facts: By American Medical Association calculations, there now exists a shortage of no fewer than 4,200 skilled industrial physicians. If by "limited" money is meant, some connections with starting annual salaries for the young and trained of $12,000 and better are going begging.

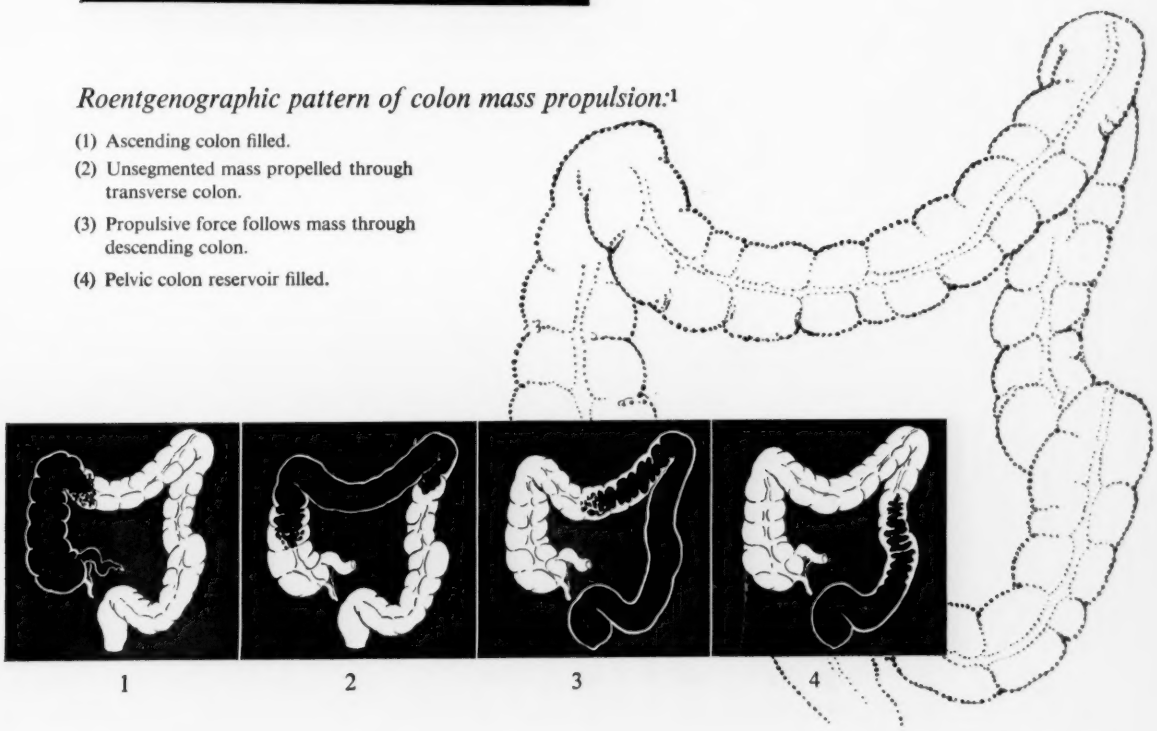
The National Fund for Medical Education needs the support of all industrial physicians and deserves that support. The tactics of the Fund in this one instance scarcely will lead to any outpouring of eagerness. The Fund is behaving on the basis of "unconditioned love"—"Love me whatever I do." The mildly trampled victim protests.

Medical Advance, 4:1 (January-February) 1956—published by the National Fund for Medical Education.

SMOOTHAGE ACTION IN CONSTIPATION

Roentgenographic pattern of colon mass propulsion:[1]

(1) Ascending colon filled.
(2) Unsegmented mass propelled through transverse colon.
(3) Propulsive force follows mass through descending colon.
(4) Pelvic colon reservoir filled.



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The average adult dose is one rounded teaspoonful of Metamucil powder in a glass of cool water, milk or fruit juice, followed by an additional glass of fluid if indicated.

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1. Best, C. H., and Taylor, N.B.: The Physiological Basis of Medical Practice: A Text in Applied Physiology, ed. 5, Baltimore, The Williams & Wilkins Company, 1950, pp. 579-583.

2. Bargen, J. A.: A Method of Improving Function of the Bowel, Gastroenterology *13*:275 (Oct.) 1949.

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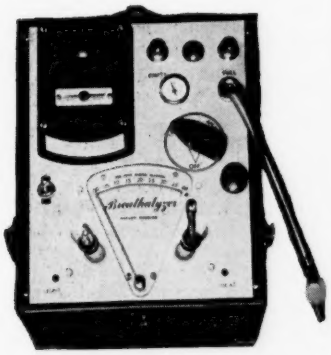

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News, Comment, Opinion

ONE THING is sure: for industrial medicine, it's "off to the races" in a big way! There are simply no limits, no horizons, that can be sighted for what industrial medicine can do.

—*Occupational Hazards*, December, 1955.

Phenol

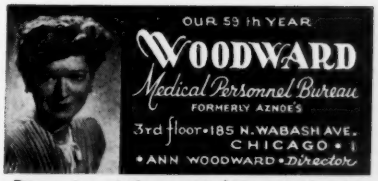
A ONE-YEAR research project of the independent Air Pollution Foundation, conducted by Battelle Memorial Institute in Columbus, Ohio, points the finger at an air contaminant which may not be a contributor to smog, but could be injurious to health. That suspect is phenol, of which carbolic acid is representative. A study of the emissions from typical backyard burners shows that for every ton of rubbish burned, more than eight pounds of the emissions are these phenols. Dr. W. L. Faith, Vice-President and Chief Engineer of the Foundation, said, "It's interesting to note that last year's aerometric survey (conducted by the Foundation for the County of Los Angeles) showed that phenol constituents in the atmosphere were higher in Pasadena than elsewhere in the Basin. Furthermore, the only source of phenols that we know of is the burning of rubbish."

Exhibits

THE SECTION on Preventive and Industrial Medicine and Public Health of the American Medical Association is now accepting applications for its exhibit at the June 11-15 Annual Session of the AMA in Chicago. The committee wants exhibits which portray the latest developments in the fields of preventive medicine, industrial medicine, public health, research in any of these fields, teaching exhibits, or coordinating exhibits in any of these fields. Persons who are presenting papers before the Section are particularly invited to contact the committee about a correlating exhibit.

Hygienic Guides

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION announces a new group of informative bulletins called "Hygienic Guide Series." Concerned with common industrial materials which present occupational health hazards



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Medical Director: (b) M.S. (Medicine); Dipl, internal medicine; Board eligible, cardiology; 6 years, successful priv pract, int medicine & instructor, cardiology; Phil area only; middle 30's.

Ass't Medical Director: (c) M.S. (indus medicine); A.E.C. Fellowship; 3 yrs, med officer, USAMC; seeks indus medicine, with or without atomic installation, pref in Illinois or Wisc; past yr, gen'l pract in lge industrial center. early 30's.

Staff Phy: (d) Graduate, Hanneman Medical College; past 6 yrs, successful private gen'l pract; seeks indus medicine with regular hours, salary & security; early 30's; inter in indus med as career; any locality but prefers Pa., Va., or East.

Staff Phy: (e) MD degree, Duke; complet'g training in internal medicine; prefers indus medicine in Calif, Texas, Ohio, Pa., New Jersey; age 29; married, 1 child (4).

Staff Phy: (f) MD degree, Jefferson Medical College; 2 years, medical officer, USAMC; 3 years, private gen'l pract; desires indus med with regular hours; consider any large city but prefers New Jersey, Pa., New York. seeks indus med as career. age 30.

Staff or Assistant Med Dir: (g) MD degree, Hahnemann Med College; 15 years, Ass't medical dir, ass't dir and, now, admin dir, important Liberal Arts University; seeks indus medicine; experience, both clinically & administrativelv should prove valuable; present position offers little further oppor for development; mature man with sound values; any locality but prefers Penna or East. late 40's.

Staff: (h) Internal medicine & physical therapy interests; 18 years, successful private gen'l pract; desires to specialize in one branch of medicine; prefers full time appointment in large industry; middle 40's. widower; any locality.

Staff: (i) Medical Degree, Harvard; Board eligible internist; past 2 years, private gen'l practice; seeks indus medicine; excellent references; early 30's; draft exempt; any locality. immed available.

Staff: (j) Excellent residencies, 1 year each, general and orthopedic surgery; since '52 industrial physician, U.S. Arsenal; prefers West Coast. age 32.

Staff or Ass't Medical Director: (k) MD degree, Univ of Maryland, Schl of Med; several years successful private practice; 3 years, plant physician, important company, major industry; (chemicals); while prefers med directorship, small industry, will consider assistantship, if very large company or staff position provided opportunity exists for advancement in short time; excellent personality with good experience in indus medicine; early 40's; recommended.

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Medical Education Week

THE MEDICAL profession and all allied medical personnel are being called upon to help promote the first nationwide observance of Medical Education Week, April 22-28. Each community, whether or not it includes a medical school, is requested to plan programs dramatizing the great progress of our medical schools in recent years. Specifically, Medical Education Week has three functions: (1) to focus national attention on the significance of medical education and the problems of medical schools; (2) to bring home to the public the contributions of medical science to American life, and (3) to foster public interest, through wide public knowledge, in the private support of medical education. "The sponsors of the Week hope the American people, through an awareness of the benefits received through the schools' achievements, will be converted from a disinterested—and sometimes hostile—public to appreciative friends of medical education."

Fatigue

EXPERTS know that there are two basic factors causing fatigue. One involves emotion: it is known that boredom and poor social adjustment take a toll. The second major factor is physiological. In this area, Dr. Lucien Brouha, of the Haskell Laboratory of Industrial Toxicology, has conducted an exhaustive study in plants of the Aluminum Company of Canada. He has measured the effects of environmental conditions as well as the psychological make-up of the workers involved. From his studies, the following six basic proposals for reducing industrial fatigue have evolved. Properly applied they can provide substantial labor saving: (1) select physically fit workers; (2) organize adequate worker teams; (3) insure adequate water intake; (4) reduce the heat load; (5) reduce the work load; (6) organize adequate rest periods.

—From "Six Ways to Reduce Worker Fatigue," in *Management Methods*, January, 1956.

Good Business

HIRING disabled workers is "a good business proposition" at Hughes Aircraft Corporation, Culver City and Tucson, 17% of whose employees are disabled and "very satisfactory employees." Like employees of Abilities, Inc., Hughes' handicapped workers have less lost time accidents, less tardiness and absenteeism, according to company spokesman, who reported: Paraplegic cases are employed in every job classification that does not require standing or walking. Blind workers handle intricate assemblies involving 25 different parts. Other disabled employees include: polio casualties, epileptics, many with crippled legs or arms, arrested tuberculars, nearly

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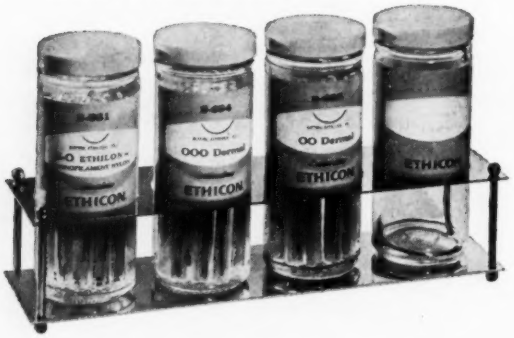

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3% solution Quinine with 2½% Camphor for Intramuscular Injection

100 cardiac cases, one-armed machinists, typists and comptometer operators.

—*Industrial Relations News*, January 28, 1956.

Radiation Diseases

UNIONISTS, too, are concerned about workmen's compensation coverage of radiation diseases. According to Dr. Herbert K. Abrams, Director of the Union Health Service in Chicago and International Chemical Workers' Medical Consultant, symptoms of radiation in the form of cancer and leukemia show up anywhere from two to 36 years after actual exposure to harmful doses of radiation, too late for claims to be made under existing laws. "Very often," Dr. Abrams asserted, "such diseases turn up long after the employee has left the job and area where he was exposed to radiation."

—From *Wall Street Journal*, January 31, 1956.

Tension Spasm

THE spastic colon is the most frequent cause of abnormal distress and discomfort. The condition occurs in all walks of life and is most prevalent among executives, secretaries, and other overly conscientious workers. It never kills or disables but affects productivity, interest, attendance, and capability . . . . In industry, some victims of irritable bowel are the most brilliant and productive employees. They are conscientious about their work and encounter distress only when they must attend an important conference, give a speech, or make a

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CONTROLS THE TRIAD OF
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difficult decision. Obviously, the best treatment is to eliminate all tension and to avoid situations that lead to anxiety, disappointment, fear, or guilt. But most of us have to work to live and nowadays competition is keen. Furthermore, not everyone is fortunate enough to have an employer who is more considerate of his employees than of his business. For this reason, the majority of sufferers must depend upon medicines that relieve spasm or take the edge off emotional strain.

—From "Why the Bowel Goes Into Spasm," by THEODORE VAN DELLEN, M.D., in "How To Keep Well," *Chicago Tribune*, February 1, 1956.

Saves Money

PREVENTIVE medicine provided under union health-welfare plans saves money, according to Edward Fenner, Executive Director of Local 705, Chicago Truck Drivers. He explained that in 1955 an average of 7,000 visits a month were made by members of the union and their families at the union's three health centers. That is 1,500 more visits a month than in 1954. Because of earlier treatment of ailments, illnesses generally were less severe, and the money paid out by the union for hospitalization and sickness

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Acetylsalicylic Acid	2½ gr.	2½ gr.
Phenacetin	2½ gr.	2 gr.
Caffeine	¾ gr.	½ gr.
	1 tablet q.i.d.	2 tablets t.i.d.
	In bottles of 24, 100 and 500 tablets.	*In bottles of 50 and 500 tablets.*

WHITE LABORATORIES, INC. KENILWORTH, NEW JERSEY

compensation was lower. The audited report of the union's health-welfare program showed that sickness compensation paid to union members dropped to $236,583 in 1955 from $244,082 in 1954. Hospitalization costs totaled $300,568 in 1955, as compared with $306,139 in 1954.

—*Chicago Daily News*, January 31, 1956.

Menninger Plan

LAST October, the Rockefeller Brothers Foundation granted the Menninger Foundation $105,000 with which to launch the latter's Industrial Mental Health Division. Based on advice from those concerned with emotional problems in industry, the Menninger plan is to begin a small service along those lines about July 1. At that time, a particular industry will be chosen by the staff for a two- or three-year study. Representatives of four industries, retailing among them, have volunteered for the study but a final choice has not yet been made. Following the study, Menninger will seek support from industry, not only financially for research and training but also for putting psychiatric consultants on company payrolls and for establishing emotional-aid stations where people work.

—Samuel Feinberg, in *New York Women's Wear Daily*, January 10, 1956.

Canada Program

THE Department of National Health and Welfare and several provincial Departments of Health have full-time staffs of experts working on specific health problems associated with industry. Much of the tremendous improvement in conditions of work in factories may be credited to the efforts of such departments and, of course, to the cooperation of progressive management. In the industrial field, the substantial increase in the number of physicians and nurses engaged, full- or part-time, in maintaining factory health programs testifies to the growing appreciation by management of the importance of keeping personnel healthy on and off the job. Education plays a vital role in developing sound industrial health measures, and in this connection, the Health League of Canada has taken a leading part. Through its National Industrial Health Committee, which includes prominent industrialists, physicians and nurses specializing in industrial medicine, and representation from organized labor, a program of health education has been developed to work in cooperation with industry, health departments and other organizations interested in employee health. Some of its efforts include: an Industrial Health membership plan; conferences; publication of an industrial health section in the magazine *Health*; surveys, poster and pamphlet distribution; film circulation, etc. While, as indicated, a good deal of progress has been made, there are many thousands of factories —particularly smaller ones—in which there is no provision (beyond a most elementary first aid kit) for employee health. Health programs of a positive type can be moulded to fit the needs of any size of factory at costs which are more than met by decreased absenteeism, greater alertness, etc. Health department authorities offer help in planning.

—From "Health Facts," published by the Health League of Canada, 111 Avenue Road, Toronto 5.

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Each tablet contains 5mg. **amphetamine** and 1mg. **Rauwiloid**®

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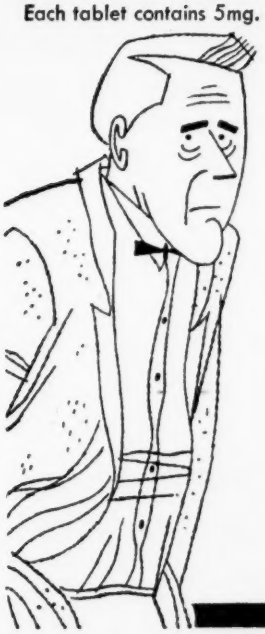

Replaces despondency with equanimity ...without euphoria...without jitters...without barbiturate drag.

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DOSAGE: For mood elevation, initially 1 to 2 tablets after breakfast and lunch.

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FOR OBESITY Rauwidrine curtails appetite without the "black mood" feeling of deprivation.

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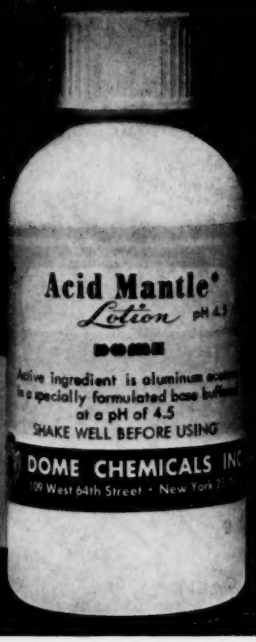

The normal skin has an acid pH between 4 and 6. This acid mantle acts as a protective barrier.

When the skin is washed with soap or detergents, or is exposed to chemicals, solvents, et cetera, the protective acid mantle is removed.

This exposes the unprotected skin to contact irritants and pathogenic organisms. It results in a rise in the skin pH above 7, provides a fertile field for development of harmful bacteria and fungi, and may result in various types of dermatitis.

Dome Acid Mantle returns the skin to its normal acid pH in a matter of seconds and holds it for hours. Both the creme and lotion are greaseless and stainless.

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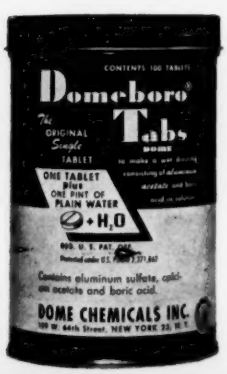

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Do you want to live forever?"

That yell, and the charge that followed, made Sergeant Dan Daly famous. But he wanted no glory. He already had *two* Medals of Honor, one earned in Peking, the other in the jungles of Haiti.

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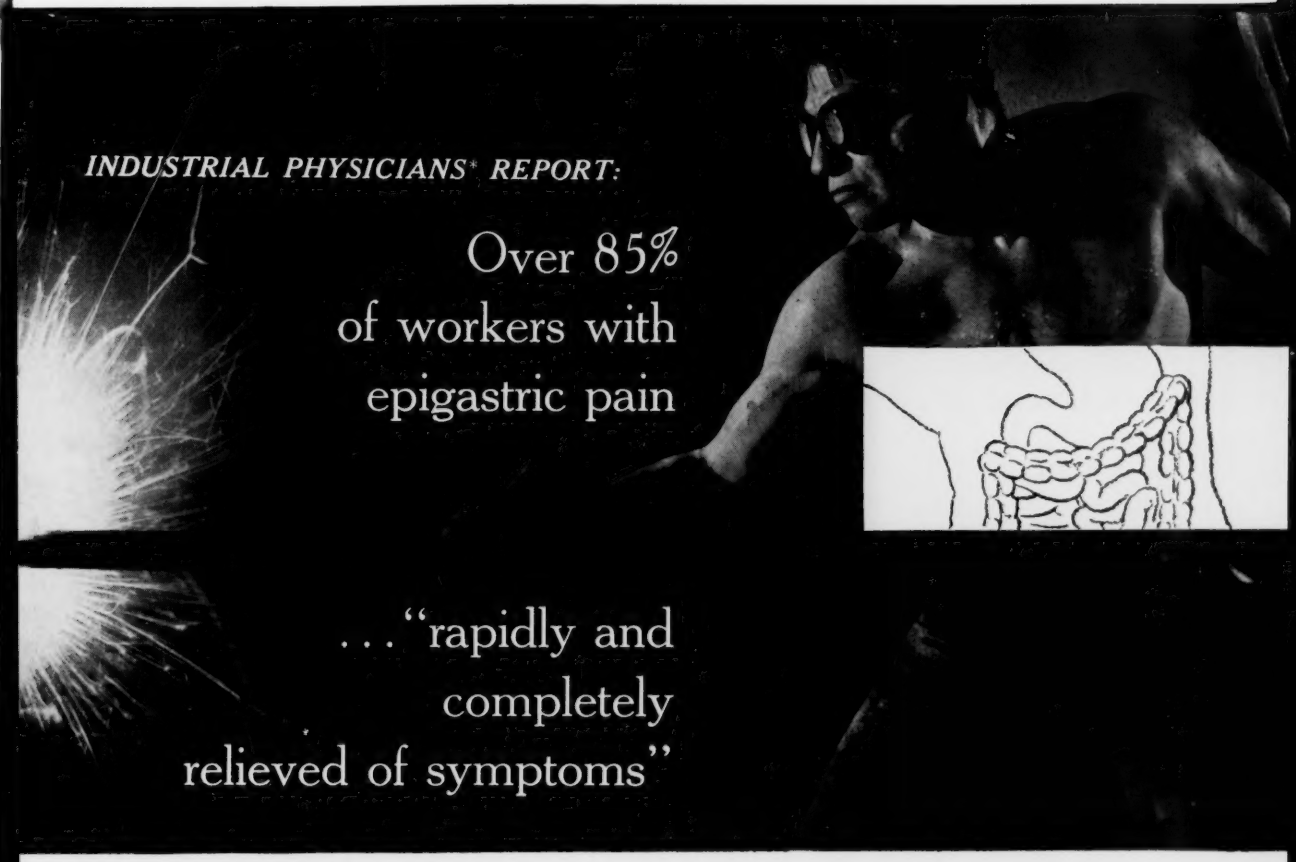

Noting that gastrointestinal symptoms were the chief complaints of more than half the workers reporting for treatment to their industrial clinic, Barden and co-workers* undertook an evaluation of Donnatal in providing rapid relief and minimizing absenteeism.

Based upon repeated clinical observation, case records, and progress reports over an eight-month period, the investigators conclude that Donnatal is "particularly effective for the relief of pain associated with smooth muscle spasm of the gastrointestinal tract." They observe also that:

"More than 85% of patients with epigastric pain and discomfort were rapidly and completely relieved of symptoms."

"... many employees were able to resume work within an hour."

"There was no evidence of undesirable side reactions."

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are particularly useful for industrial therapy, because once-a-day dosage provides effective spasmolysis for a twelve-hour period without the inconvenience of the customary four-hour dosage schedule. True *extended action* spasmolytic effects are provided by the special construction of Extentabs. Immediately after administration the equivalent of one Donnatal tablet is released, followed by the gradual and uniform release of the equivalent of two more Donnatal tablets, to provide sustained effects for 10 to 12 hours.

Each Donnatal tablet or capsule or each 5 cc. teaspoonful of Donnatal Elixir contains: hyoscyamine sulfate 0.1037 mg., atropine sulfate 0.0194 mg., hyoscine hydrobromide 0.0065 mg., phenobarbital (¼ gr.) 16.2 mg.—bottles of 100, 500, and 1000 tablets or capsules, and bottles of 1 pint and 1 gallon of elixir.

Donnatal No. 2 Tablets contain the same amounts of belladonna alkaloids with 32.4 mg. (½ gr.) phenobarbital per tablet—bottles of 100 and 500 tablets.

Donnatal Extentabs contain active ingredients equivalent to three regular Donnatal tablets—bottles of 100 and 500.

*Frank W. Barden, M.D., Paul S. Hill, M.D., William F. Mahoney, M.D., and Kenneth J. Cuneo, M.D., in a report from the Medical Department of the Saco-Lowell Shops and the Webber Memorial Hospital, Biddeford, Maine; published in the January, 1954 issue of the Journal of the Maine Medical Association (Vol. XXXXV, No. 1, Page 11).

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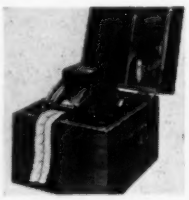

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*Ormsby, O.S. and Montgomery, H., *Diseases of the Skin*, 8th ed., 1954.

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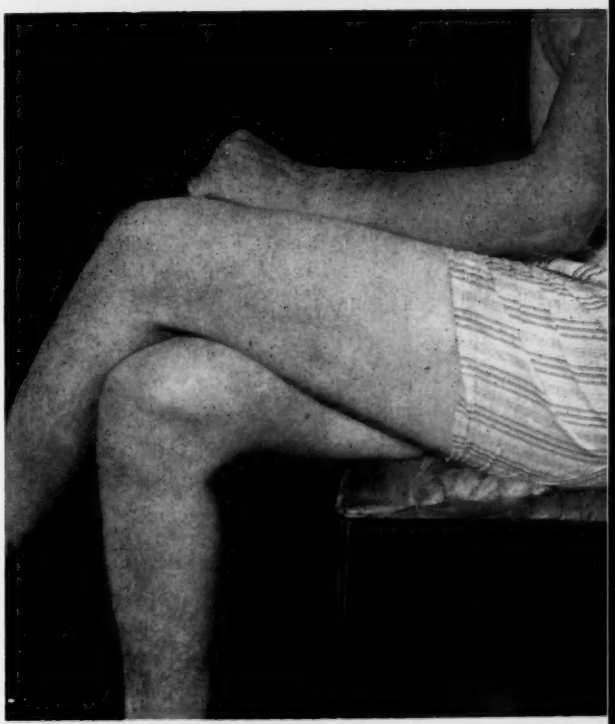

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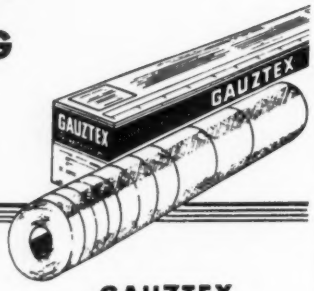

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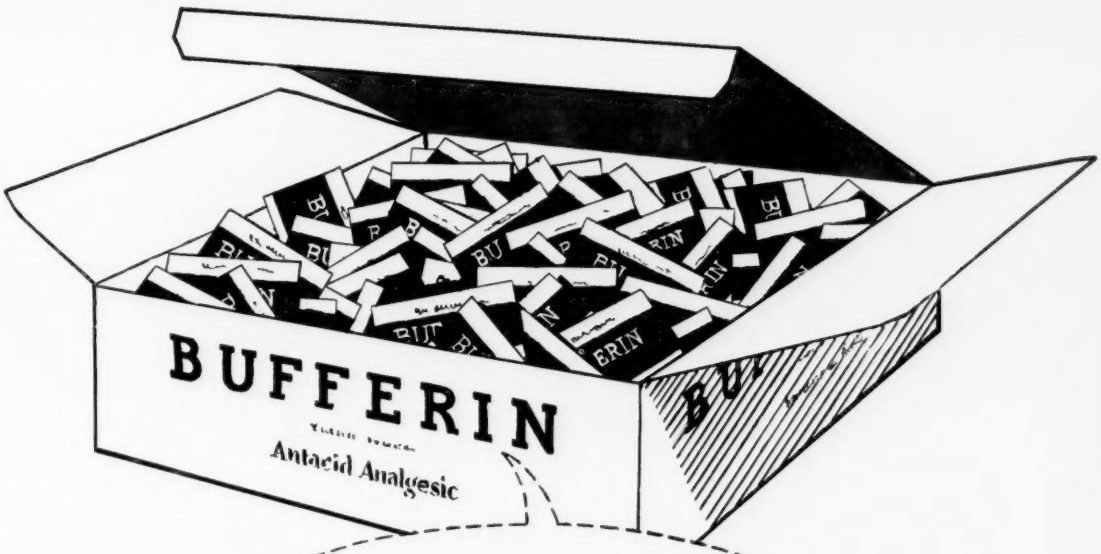

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References: 1. Indust. Med. 20:480, 1951. 2. J.A.M.A., 158:386, 1955.

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1. Osol, A., and Farrar, G. E., Jr.: The Dispensatory of the United States of America, 24 Ed., J. B. Lippincott Co., Philadelphia, 1947, p. 1620.

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